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CONTENTS

PSYCHOLOGICAL STUDIES ON THE SUDANESE AND GUINEAN NEGROES: A REVIEW
by Donald A. Swan 163

THE ORIGIN OF THE CLAN MACKAY
by Robert L. Mackay 199

THE IMPACT OF FAMINE ON I.Q.
by Nathaniel Weyl 211

THE ANTHROPOLOGICAL FIND FROM THE SZABADSZALLAS-BOCZA ESTATE IN HUNGARY
by Pál Lipták 214

ON A PRIORI GENETIC INFORMATION
by F. J. Irsigler 219

RELATIONSHIP BETWEEN PERSONALITY AND CERTAIN ASPECTS OF HANDWRITING
by Henry H. Reiter 227

BOOK REVIEWS 231

BOOKS RECEIVED 236

JOURNALS RECEIVED 237

Articles appearing in this journal are abstracted and indexed in *Historical Abstracts* and *America: History and Life*

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Psychological Studies on the Sudanese and Guinean Negroes: A Review

By DONALD A. SWAN

The link between race and psychology has long been a subject of scientific interest. When the great Swedish naturalist Carl von Linnaeus advanced his famous classificatory system—*Systema Naturae Per Regna Tria Naturae* (1735)—he encompassed all nature and included man himself. Linnaeus subdivided man into four varieties or races and employed behavior and temperament as diagnostic racial traits, in addition to skin color, hair color, and bodily structure. Thus, Linnaeus described the European as light, active, ingenious, and governed by customs, the Asiatic as severe, haughty, miserly, and governed by opinion, the American (Indian) as persevering, content, free, and governed by customs, and the African as crafty, lazy, negligent, and governed by whim.

In the nineteenth century, Dr Samuel G. Morton—the founder of the American School of Ethnology—amassed a collection of crania of different races and provided quantitative estimates of racial differences in cranial capacity. He also listed behavioral or "moral" characteristics of the primary races of man. In his work *The Descent of Man* (1871), Charles Darwin noted that the various races of man differed in the form and capacity of the skull, as well as in the convolutions of the brain. Darwin also observed that the mental characteristics of the races are likewise very distinct, "chiefly as it would appear in their emotional, but partly in their intellectual faculties."

In the late nineteenth and early twentieth centuries differential psychological methods and techniques were developed which could provide quantitative estimates of individual and group differences in mental and behavioral traits, as well as in sensory and motor abilities. These methods and techniques were soon applied to the comparative study of racial and national groups. The Cambridge Anthropological Expedition to the Torres Straits in southeast Asia, in the early 1900s was one of the earliest such investigations. Europeans and native peoples from the Torres Straits were compared on measures of sensory perception and other psycho-physical traits.

Individual tests of intelligence and mental ability were developed in the early 1900s by Alfred Binet in France, William Stern in Germany, and Lewis Terman in the United States. Group tests of intelligence were constructed shortly thereafter. They were applied on a large scale in the United States—first by the U.S. Army in the

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First World War and afterwards in school systems throughout the country.

During the next half century numerous studies were conducted on the relative performance on tests of intelligence on American Negroes. Much of this material has been summarized and critically evaluated by Dr Audrey M. Shuey in her book *The Testing of Negro Intelligence* (1966). For the time period 1913-1965, she reviewed some 382 studies on many thousands of American Negroes employing some 60 different intelligence tests. Dr Shuey found the mean I.Q. of American Negroes to be between 15 and 20 points below the mean I.Q. of American Whites—with the difference remaining constant throughout the fifty years.

In 1966 the U.S. Office of Education published a detailed study of American education entitled *Equality of Educational Opportunity* (by James S. Coleman, *et al.*). More than 600,000 children enrolled in grades 1, 3, 6, 9, and 12 of some 4000 representative U.S. public schools were surveyed in this study. Verbal and non-verbal ability tests were administered to all students. Median test scores were tabulated for some 20 racial and regional categories. The highest average scores on both ability tests were obtained by American Whites, followed in order by Oriental Americans, American Indians, Mexican Americans, Puerto Ricans, and Negroes.

The mean Negro ability test scores tended to be about one standard deviation unit below the mean White test scores, so that Negro overlap of the White mean was about 15 per cent. Substantial White-Negro ability test differences were found at all grade levels and in all regions of the United States. The lowest White regional ability test scores (from the rural southeast) were still significantly higher than the highest Negro regional ability test scores (from the metropolitan midwest).

The relationship between socio-economic and cultural factors and racial differences in intelligence test performance has been explored by a number of investigators. Dr F. C. J. McGurk, for example, found large and significant differences in test performance between American Whites and Negroes matched for eleven elements of socio-economic background. He also found greater White-Negro differences on "least cultural" questions than on "most cultural" questions. Other investigators have found greater White-Negro differences on tests of non-verbal ability than on tests of verbal ability. Finally, Dr McGurk noted that in comparative studies of the intelligence test performance of Whites and Negroes conducted in the U.S. over a fifty year period, racial differences had remained constant despite large improvements in the social and economic conditions of Negroes relative to those of Whites. None of these research findings provided support for "cultural" or "environmental" explanations of observed racial differences in intelligence test performance.

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In a recent paper on "Race and Mental Ability" (1974),[1] Dr Arthur Jensen thoroughly explored the main facts and theoretical issues involved in the study of human racial differences in behaviors commonly regarded as indicative of mental ability. He contended that the most comprehensive framework for the scientific study of population differences in abilities is provided by evolutionary theory, population genetics, the polygenic theory of intelligence, developmental psychology, and psychometrics. Dr Jensen reviewed and analyzed research on the magnitude of White-Negro differences in intelligence test performance, the heritability of I.Q., the regression toward the means of their respective populations of the siblings of White and Negro subjects, the relation between environmental variables and intelligence test performance, and the culture-bias of I.Q. tests. Also included in the review was an analysis of racial differences on tests of Level I ability (characterized by reception, retention, and recall on cue, with a minimum of mental manipulation or transformation) and Level II ability (involving mental manipulation and transformation of inputs in order to arrive at a satisfactory output), Negro deficits on tests of spatial visualization ability, and racial differences on tests of copying geometric forms, on Piagetian tests of cognitive development, and on information processing tests.

Dr Jensen found that none of the environmental factors advanced to explain the Negro I.Q. deficit—inequality of schooling, teacher expectancy, motivation, language deprivation, nutrition, and reproductive casualty—"adequately accounts for the facts of Negro performance on mental tests." In view of the failure of numerous environmental hypotheses to be borne out by evidence, and in terms of what is already known about human evolution, about a host of other kinds of racial differences, about the relative contributions of genetic and environmental factors to differences in mental abilities, and about the constancy (relative to the variability within groups) of White-Negro differences in I.Q. and a wide variety of other indices of cognitive development from childhood to maturity, Dr Jensen concluded that "it appears highly probable that genetic factors are involved to a substantial degree in the lower average I.Q. of American Negroes."

In his paper on "Race and Mental Ability," Dr Jensen also pointed out that there has been vastly more relevant research on representative samples of Whites and Negroes in the United States than of any other racial groups. Comparative psychological studies have been conducted, however, on samples from a number of populations in Africa, Asia, Australia and New Zealand. Much of this research was undertaken on African Negro populations by

[1] Arthur R. Jensen, "Race and Mental Ability," Paper presented at a Symposium of the Institute of Biology on "Racial Variation in Man," Royal Geographic Society, London, 19th and 20th September 1974.

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scientists from several different European countries—Great Britain, South Africa, France, Belgium, Italy, Spain, and Portugal. Some of these studies on the comparative intelligence test performance of African Negro populations were reviewed and analyzed by Gerard Wintringer in his article "Considérations sur l'intelligence du Noir d'Afrique" (*Revue de Psychologie des Peuples*, Vol. 10, 1955, pp. 37-55). Dr J. C. Carothers provided a review of brain research and studies of personality and temperament in sub-Saharan Africa in his classic work *The African Mind in Health and Disease* (1953).

Some of the most important research in the field of anthropo-psychology was conducted on Negro population samples from French West Africa by the Belgian scientist Dr Georges A. Heuse. Dr Heuse obtained his doctorate in the field of psychological anthropology (*l'anthropologie psychologique*). He is a director of the Department of Ethnopsychology of the Institute of Applied Social Psychology (I.P.S.A.) and a former member of the Department of Social Sciences of U.N.E.S.C.O. Dr Heuse has engaged in extensive research and writing in the fields of ethnopsychology and psychological anthropology. He has written several books—including *La Psychologie Ethnique* (1953) and *Eléments de Psychologie Sociale Générale* (1954)—and numerous articles on these subjects.

During the early months of 1955 Dr Heuse and his associates carried out an intensive investigation on some 100 Sudanese and Guinean Negro soldiers in good health in the laboratories at the Michel-Levy Hospital in Marseilles, France. The subjects were systematically studied from the standpoint of anthropometry, morphology, biochemistry, physiology, psycho-physiology, and psychology. The results of the anthropometric, biochemical, and physiological studies were presented in Dr Heuse's book *Biologie du Noir* (1957). The results of the psychological studies were presented in an article "Etudes Psychologiques sur les Noirs Soudanais et Guinéens" (*Revue de Psychologie des Peuples*. Vol. 12, No. 1, 1955, pp. 35-68). It is the purpose of this paper to review and analyze Dr Heuse's psychological research, which included investigations of racial differences on tests of perception, memory, attention, performance and development, and personality.

THE SUBJECTS

The subjects of Dr Heuse's investigation were male African Negro soldiers from the French army. They were professional soldiers, either volunteers or conscripts for three years of service. Their average age was twenty-four years and four months. The ethnic and tribal composition of the sample was as follows: 54 Sudanese (comprising 17 Mandingoes, 11 Djerma, 11 Mossi, 6 Ouolof, 3 Haoussa, 2 Sérèros, 2 Sara, and 2 Diola), 25 Guineans (comprising 8 Kissians, 5 Toma, 4 Soussou, 3 Baoulé, 1 Guerzé, 1 Mina, 1

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Kouranko, 1 Coniagui, and 1 Bimala), 13 Foula, and 1 Bantu, a native of the Belgian Congo.

The great majority of the subjects were Moslem—65 out of 92. Nineteen were Catholic, three Protestant, and five Fetichist.

Fifty-five, or more than one half, of the Africans were farmers. Among the latter, five also practiced a secondary trade or expressed a desire to do so after completion of their military service. Nine were apprentice drivers, four apprentice mechanics, three blacksmiths, three tailors, two carpenters, one apprentice jeweler, one weaver, one professional soldier, one house painter, one shepherd, one cattle-dealer, one fisherman, one veterinary assistant, one waiter, one telephone operator, and one houseboy.

The majority of the subjects were illiterate. Fourteen could read, 14 could read and write, and two had diplomas from school.

All the subjects knew French, at least the rudiments. According to Dr Heuse, they expressed themselves sufficiently well for the requirements of the study and they understood the instructions in a satisfactory manner.

One-third of the Negroes spoke one or more African languages, in addition to their native language and French. One Foula knew five African languages and another three. Ten Negroes belonging to diverse ethnic groups spoke two languages and 20 Negroes one African language. One Mandingo spoke Portuguese, one Foula and one Djerma spoke English, and a Protestant Mandingo, a Catholic Sara, and a Moslem Soussou spoke Arabic.

One subject had resided in France for four years, 21 subjects for three years, 24 subjects for two years, and 31 subjects for one year or less. On the average the date of their induction into the army was one year prior to their arrival in France. The state of health of these Negroes was excellent. It was comparable to that of Whites in good health. Dr Heuse noted that this favorable state of health is encountered only exceptionally in Black Africa, where man is always to some degree the victim of parasitic diseases. The climate in Marseilles, in southern France, is borne well by the Negro. Only the cold days of wintry mistral winds seemed to bother the subjects, but no more so than the White inhabitants of Marseilles. Even so, these conditions were rare during the winter of 1954-1955.

The Negroes who are inducted into the French army are subject to a very complete medical examination. The selection is even more rigorous for the soldiers of the regiments which are to be stationed in Metropolitan France. Under these conditions, Dr Heuse noted that the criticism may be advanced that the sampling is not representative of the parent population. This could be partly true with respect to the anthropometric measurements, but certainly does not hold for the psychological data. Carothers (1954) suggests, with good reason, that if one does not take into account the health conditions, one may not be able to determine with certainty the

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psychological norms of the Negro. For the diverse endemic disease of the African milieu profoundly affect the mental functions.

With regard to the socio-economic background, two-thirds of the Moslems, one-third of the Catholics, all of the Fetichists, and two out of the three Protestants were farmers. Forty-two per cent of the Catholics and 31 per cent of the Moslems were somewhat literate. The two subjects with school diplomas came from the latter group. Two of the three Protestants could read and write, while the five Fetichists were all illiterate. Thirty-six per cent of the Moslems, 26 per cent of the Catholics, the three Protestants, and one of the five Fetichists spoke at least two African languages. It is obvious that all these socio-economic aspects are important to the psychological aspects of our investigation.

Many of the subjects were married and fathers. They were unanimous in their view that three years constituted too long a separation from their families. They would often become moved while talking of them. Dr Heuse and his assistants always tried to relax the subjects and were successful in establishing a cordial environment, which often proved fruitful. As a consequence of this environment and the absence of all emotional tensions, Dr Heuse believes the results of these studies may be considered as particularly valuable.

PERCEPTION

Perception was studied in the African series in two of its aspects: anomalies of *visual perception*, with optical illusions, and keenness of *weight perception*, with the aid of the Piéron gravimeter.

At the beginning of this century, Rivers (1905) noticed among the Toda a very strong resistance to the Müller-Lyer illusion, when compared to that found among the Whites. Rivers suggested that this difference was due to an analytic type of perception in the Toda and a synthetic type in the Whites.

Dr Heuse applied a differential study of optical illusions to the series of White and Negro subjects. The test battery consisted of the Müller-Lyer illusion (Figure 1), the Wundt illusion (Figure 2), the Poggendorff illusion, with a five millimeter cylinder (Figure 3), and a ten millimeter cylinder (Figure 4), the Geza-Révész illusion (Figure 5) with a variation where the figure at the bottom of the arch is one millimeter longer than the figure at the top (Figure 6), two illustrations of the irradiation phenomena (Figures 7 and 8), and finally the Helmholtz squares (Figure 9).

The entire White group (78 subjects) showed itself receptive to the Müller-Lyer illusion. In the series of 82 Negroes, 74 were subject to the illusion, six were not, and two were found to perceive the opposite line larger. The proportion of non-sensitive subjects among the Negroes (7.26 per cent) appeared very high to Dr Heuse.

The Wundt illusion was perceived by the entire White group and

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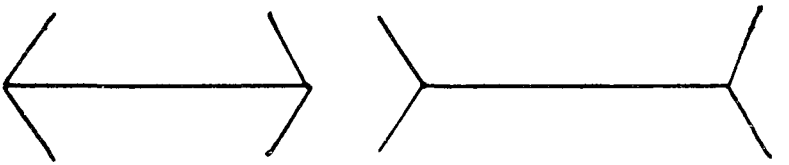

FIGURE 1—Müller-Lyer illusion.

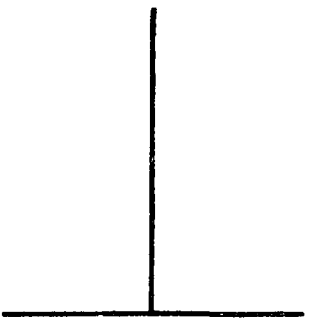

FIGURE 2—Wundt illusion.

FIGURE 3—Poggendorff illusion.
(5 mm. cylinder).

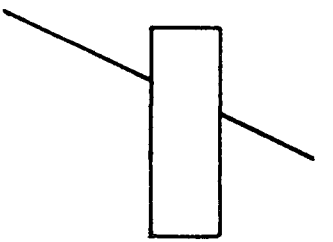

FIGURE 4—Poggendorff illusion.
(10 mm. cylinder).

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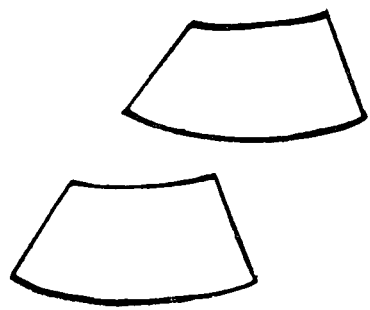

FIGURE 5—Révész illusion.

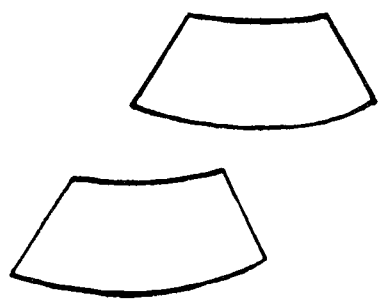

FIGURE 6—Counter-example of the Révész illusion.

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FIGURE 7—Irradiation phenomenon.

FIGURE 8—Werner squares.

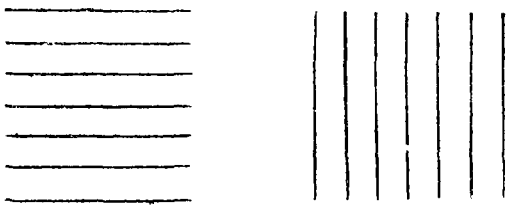

FIGURE 9—Helmheltz squares.

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by 94 per cent of the Negroes. Three of the Negroes were not sensitive to the illusion (4 per cent), while one subject indicated the horizontal line as being the larger.[2]

The Poggendorff illusion,[3] with a five millimeter cylinder, was perceived by 72 Whites (92 per cent) and by 28 Negroes (41 per cent) In the Negro group only 69 observations were retained, as a result of difficulties of explanation. Thirteen cases were suspect and were not included in the analysis.

With a cylinder of ten millimetres, only 23 per cent of the Whites were sensitive to this illusion. However, the proportion of Negroes varied only slightly (41 per cent). Dr Heuse observed that perhaps a suggestibility factor was added to the perception.

The Révész illusion[4] revealed a very large discordance. Thirty-one per cent of the Whites and 39 per cent of the Negroes were not sensitive to it. From among those who were subject to the illusion, 31 per cent of the Whites and 24 per cent of the Negroes claimed that the lower figure was larger, while 38 per cent of the Whites and 37 per cent of the Negroes found the upper figure to be larger.

With regard to the counter-example, 46 per cent of the Whites and 34 per cent of the Negroes recognized the lower figure as effectively larger. Thirty-one per cent of the Whites and 41 per cent of the Negroes found the two figures to be identical. Twenty-three per cent of the Whites and 25 per cent of the Negroes thought that the upper figure was larger. Here again Dr Heuse believed that a suggestibility factor was, without doubt, added to the optical illusion.

All the Whites were sensitive to the first irradiation test, and found the white square to be larger than the black square. Only 15 per cent of the Negroes perceived this illusion in the same manner as the Whites. Sixty-three per cent of the Negroes were not sensitive to the illusion and 22 per cent considered the black square to be larger.[5]

[2] Naturally it was verified in these aberrant cases that the subject understood well the principle of comparison of length.

[3] The Poggendorff illusion is an illusion of direction. It is generally explained by a tendency toward overestimation of the small angle and underestimation of the larger angle. This is what explains the fact that the upper and lower parts of the diagonal do not appear to be exactly an extension of one to the other.

[4] The Révész illusion is an illusion of the contrast effect. The contrast between the two figures is due to the comparison between the lower curve of the top figure and the upper curve of the bottom figure. They must be observed the way they are represented in Figure 5, without rotation. According to Révész, the top figure appears larger to the observer. But, we shall see statistically that this illusion is not true. However, it was useful to report an example of the errors of the pre-mathematical period in psychology.

[5] Perhaps a psychoanalyst will find here the mark of an ethnocentrism linked to the color of the skin or the repressed expression of a feeling of domination. Peiffer had made comparable observations with Plate IV of the Rorschach test (Protocol No. 660).

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Thirty-one per cent of the Whites and 55 per cent of the Negroes were not sensitive to the second illusion—the Werner squares. Sixty-nine per cent of the Whites and 29 per cent of the Negroes estimated the white square as the larger. Finally, 16 per cent of the Negroes and none of the Whites considered the black square to be larger than the white square. This irradiation phenomenon deserves further special study, since the ethnic group differences are very significant in this case.

Forty-six per cent of the Whites and 66 per cent of the Negroes were not sensitive to the Helmholtz squares' illusion. Twenty-three per cent of the Whites and 19 per cent of the Negroes found the square with the vertical lines to be larger. Thirty-one per cent of the Whites and 21 per cent of the Negroes considered the square with the horizontal lines to be larger.

Finally, Dr Heuse concluded that this research seems to indicate the existence of two factors which psychologists have not studied sufficiently: the extent of variability on the individual scale and on the ethnic scale. He contended that this is a typical case which shows the great gaps in differential psychology and the danger of the premature generalizations found in psychology manuals.

The *keenness of weight perception* was investigated in a group of 86 Negroes with the aid of a Piéron gravimeter. The standard weight was fixed at 325 grams. Because of a lack of time,[6] the test had to be limited to this one single measure. The average error was 38.8 grams. The distribution[7] was as follows:

Percentile	1	10	20	30	40	50	60	70	80	90	100
Negro error score	0	9	10	15	25	40	45	55	65	75	125

In comparison, the distribution for a group of 153 White French school pupils in Paris was reported by Mrs H. Piéron. For the 300 gram test, the distribution was as follows:

Percentile	1	10	20	30	40	50	60	70	80	90	100
White error score	0	8	13.5	16	20	24	32	32	32	46.3	93.3

The difference of fourteen grams between the medians of the young Whites and the adult Negroes is otherwise less revealing than the comparison of the curves. It can be said that there is no difference between the two groups up to the fourth decile. It is the uniform

[6] Each subject was the object of a biological and psychological examination of a total duration varying between 10 and 12 hours.

[7] Let us recall that the decile system is a calibration giving the values of the deciles of a distribution. We term deciles 0, 1, 2, . . ., 10 the values of the variables such that 0 per cent, 10 per cent, 20 per cent, . . ., 100 per cent of the observations are below them. The median corresponds to the fifth decile or the second quartile. The *quartiles* 1, 2, 3 are the values of the variables such that 1/4, 1/2, 3/4 of the observations are below them. In the decile system used here, 1 corresponds to the 0 decile, 10 to the first decile, etc. In this study, the values are ordered from the highest to the lowest test results. However, it makes no difference whether the psychologist expresses the values in this order or in the opposite.

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progression from the fifth to the tenth decile which makes all the difference between the Negroes and the Whites in this test. Dr Heuse believes that this test may serve equally well in anthropology as a test of concrete intelligence.

MEMORY

Dr Heuse also undertook a systematic study of the different types of memory in the Negro subjects. In spite of all the precautions taken to facilitate these tests, the results were uniformly different from those of the Whites.

The *memory of forms* was tested with the Carrard[8] small squares' test. This did not exceed 3/16 at the first attempt. For the 89 Negro subjects, the following distribution was obtained:

Number of small squares	*Number of subjects*
0 exact small square(s)	10
1 ,, ,, ,,	13
2 ,, ,, ,,	15
3 ,, ,, ,,	10
4 ,, ,, ,,	15
5 ,, ,, ,,	12
6 ,, ,, ,,	10
7 ,, ,, ,,	2
8 ,, ,, ,,	2

If the ten negative results are subtracted, the mean of the Negro group increases from 3.1 to 3.5. For the second attempt, the average of the group of 88 Negroes was 5.0. The distribution of the series was as follows:

Number of small squares	*Number of subjects*
0 exact small square(s)	1
1 ,, ,, ,,	5
2 ,, ,, ,,	11
3 ,, ,, ,,	8
4 ,, ,, ,,	17
5 ,, ,, ,,	16
6 ,, ,, ,,	7
7 ,, ,, ,,	5
8 ,, ,, ,,	10
9 ,, ,, ,,	3
10 ,, ,, ,,	5
— ,, ,, ,,	—
13 ,, ,, ,,	1

[8] The Carrard small squares' test is a test of visual memory of abstract figures. It consists of one model square 13 × 13 cm., with 16 empty boxes, and a series of 16 counters which the subject must replace on the empty square in the order indicated on the model square, after one minute of observation.

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The results were obtained when the small squares were well-placed and well-oriented. We have not taken into account the well-placed but poorly oriented small squares. The valuation of the results for the Whites can be obtained from the following norms:

Distribution of Carrard Small Squares' Test Norms (White)

Exercise	*Weak*	*Average*	*Strong*
1st exercise	2 to 4	6 to 8	10 to 15
2nd exercise	3 to 8	10 to 14	15 to 16

In comparing the Negroes and the Whites, Dr Heuse noticed that there were two striking differences: (1) a very high percentage of negative results among the Negroes (which was not observed among the Whites, except in the case of temporary epileptics); and (2) a strong concentration of weak and average values, together with the absence of strong values. In contrast, improvable memory appears comparable, with a progression of two (within the area of weak results). It is the absolute level of visual memory which differs.

The *memory of rhythm* was studied with the aid of the following test, which Dr Heuse employed because of its apparent simplicity. It was necessary to find a rhythm of 104 beats per minute in three cycles on a metronome after listening to it for fifteen seconds. Among 85 Negro subjects, only three succeeded in passing it. Sixty subjects made an error in excess of ten beats. The average error of the Negro group was twenty beats. On the other hand, the average error of a group of 30 White subjects, half of whom were sub-normal in intelligence and instruction, was 17.4.

The *memory of colors* was investigated with the aid of a very concrete test, prepared especially for our African series. After showing each subject a picture of a bird (*Porphyrula martinica*) with ten different colors on its beak and feathers, we asked him to replace the colors on a blank figure, starting with a color scale designed for use by subjects with an insufficient knowledge of the French language. In our group of 88 Negroes, we obtained only two completely correct answers. The mean for the Negro group was 4.53 out of 10 colors. In a group of 30 normal Whites, the mean was 8.5 out of 10 colors. For 10 Whites from a hospital department of neuro-psychiatry,[9] the mean fell to 5.0 out of 10.

Concrete memory was studied by means of a test based on the identification of 20 common objects after one minute of exposure. All necessary precautions were taken to avoid errors resulting from language difficulties. In the series of 89 Negroes, Dr Heuse found an average of 12 identifications out of the 20. The first quartile was 11.0, the median 12.0, and the third quartile 14.0. In a small series

[9] This was the Neuro-Psychiatric Service of the Michel-Levy Hospital in Marseilles, France, which was directed at that time by Dr P. Galais.

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of hospitalized Whites (temporal epilepsy, manic-depressive psychosis), the average was 9.5 out of 20. Among normal Whites, preliminary work indicates an average of 15.5 correct identifications out of 20.

The *memory of time* was investigated by means of a simple test which was well understood by our subjects. The subject was required to duplicate the length of time a light had been turned on by the experimenter, immediately after the latter had extinguished his light. This test, applied to a group of 71 Negro subjects, gave the following results: the average error was two seconds in the five-second test, 8.5 seconds in the thirty-second test, and 16.3 seconds in the sixty-second test. This test is inapplicable for Whites because of the possibility of cheating (counting, for example). Administration of the test to a group of hospitalized Whites (epileptics, manic-depressives, and lesser ailments) showed an average error of one second in the five-second test, 3.7 seconds in the ten-second test, and 15 seconds in the fifty-second test.

The *memory of numbers* was tested on a group of 88 Negroes with the following results:

Numbers remembered	*Number of subjects*
Less than 3 numbers	8 Negroes
,, ,, 3 ,,	14 ,,
,, ,, 4 ,,	51 ,,
,, ,, 5 ,,	11 ,,
,, ,, 6 ,,	4 ,,

While the average for Dr Heuse's series of African Negroes was four numbers, Dr Barbe in a study of African children in French West Africa found an average of four numbers in the 10-year-old group and 5.5 numbers in the 14-year-old group.[10] These values are lower than those found in studies of White children. Binet indicated the following averages for European White children: two digits for seven three-year-olds, three digits for four-year-olds, five digits for seven-year-olds, and seven digits for 15-year-olds. According to Terman, the average White child can repeat six digits at 10 years of age and seven digits at 14 years of age. The young Whites in French West Africa, according to Dr Barbe, yielded results lower than these norms, but still higher than those of the young Negroes. In a psychopathological White series, the mean was 4.4 digits. From data obtained in previous studies, Dr Heuse considered seven digits as the average for normal White adults. This also corresponds to the maximum number of digits on the Binet and Terman scales.

[10] Variability in technique can undoubtedly explain this difference. In fact, the technique and the notation of this test may vary significantly. A rigorous standardization is necessary in order for the results to be comparable.

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In order to evaluate the language factor, we practised the tests many times in French and in the language of the native. The Negro obtained the same result in French or in his native tongue if his numerical system was monosyllabic or bisyllabic as in Mossi. However, the Negro actually obtained a better result in French when his number system contained words of three or four syllables as in Sérere. Thus, such a subject, for example, could repeat correctly:

trois-neuf-quatre-un-huit (five digits in French) but could not repeat:
tadak-betfanahak-nahak-alenk-betfatadak (3-9-4-1-8) and would stop at four digits in his native language:
alenk-nahak-darah-betfolin.

Dr Heuse concluded, therefore, that this test—improperly called a memory test—can be universally employed. By taking certain elementary precautions, the anthropologist can use the test in his investigations, even if he is not a psychologist.

Finally, the investigations of Dr Heuse confirmed the findings of Dr Barbe (Pales Mission in French West Africa) and, on the whole, those of Dr Augusto (Mozambique Anthropological Mission). A very conservative estimate will provisionally estimate the memory of the African Negro[11] to be approximately 80 per cent of the memory of the White Euro-American.

ATTENTION

For the measure of attention, Dr Heuse used the Zazzo double-barrier test. In this experiment he encountered what is sometimes called Negro indolence. In spite of good intent the Negro subject clearly had difficulty and often asked permission to stop the test which was tiring him. For the White subject the test consists of crossing out 250 well-defined signs, which must be distinguished from one another, on a page of 40 lines. We had to reduce the test to 10 lines for the Negroes, who now often completed this shorter version in less time than it took the Whites to complete the entire page. For the group of 91 Negroes (whose 10-line page contained an average of 60 signs to cross out), the following results were obtained:

Number of errors	*Number of subjects*
Less than 3 omissions	12
3-10 omissions	22
10-20 omissions	27
20-30 omissions	17
More than 30 omissions	13

[11] For the American Negroes, the now out-of-date studies were conducted on children and are contradictory in their findings. Sunne (1917) reported a superiority of Negro performance, Pressey and Teter (1919) an inferiority of Negro performance, while Schwegler (1920) found an equality of White and Negro performance.

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Errors, which were quite exceptional among White subjects were very common among the Negroes: 46 subjects made 0-2 errors 11 subjects 3-8 errors, 10 subjects 9-20 errors, and 24 subjects more than 20 errors.[12]

The performance time was as follows:

Time	*Number of subjects*
2 min. 31 sec. to 3 min. 30 sec.	4
3 min. 31 sec. to 4 min. 30 sec.	6
5 minutes	12
6 minutes	9
7 minutes	10
8 minutes	8
9 minutes	8
10 minutes	7
11 minutes	7
12 minutes	8
13 minutes	4
14 minutes	2
15 minutes	1
16 minutes and over	4

The small series of psycho-pathological Whites scored an average of 27 errors in 18 minutes (for the entire page of 40 lines). The average for 31 normal Whites was 13 errors in 9 minutes. In contrast, the African Negroes, whose average error was 15 errors for a 10-line page would have made an average of 60 errors on the full page of 40 lines.

Attention, as measured by this test, is subject to important individual and group variations. Only 14 per cent of the Negroes reached or surpassed the mean score of the normal White series, while 30 per cent attained or surpassed the mean score of the abnormal White series.

Dr Heuse concluded that this test is not adequate for the Negro.[13] Nevertheless, an analysis of the behavior of the Negro subjects during the test revealed a notable weakness of mental tone in the face of an unaccustomed task. The fact that a large proportion of the subjects spontaneously expressed their discomfort and their difficulty cannot be neglected.

Dr Heuse also investigated the importance of the educational factor in the test performance. In the group of 30 literate Negroes the average score was 22.63 errors, while for the 60 illiterate Negroes

[12] The additions under the circumstances.

[13] Dr Heuse believes that the ideal test for the Negro (and for White children, as well as for illiterates, in general) should consist of having the subject *touch* and push with his fingers all the samples of a plant or animal, with the figures in wood or in metal. Six other samples, for example, would be represented, forming a group of 300 elements. The principle would be followed, but the test would be more concrete without the intervention of paper and pencil.

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the mean was 34.60 errors. The "t" of Student[14] yielded a value of 1.90, which was statistically significant at the 5 per cent level, Consequently, the influence of the educational factor is confirmed. but not as strongly as one would be inclined to suppose. At a comparable educational level, the Negroes and the Whites achieve test results which are significantly different.

PERFORMANCE AND DEVELOPMENT TESTS

The three most complex mazes from the *Porteus Maze Test* were administered to a series of 92 Negroes. The average performance time for the three mazes together was 4 minutes 36 seconds. The distribution of the test results was as follows:

Time	*Number of subjects*
1 min. 30 sec. to 2 min. 30 sec.	3
2 min. 31 sec. to 3 min. 30 sec.	21
3 min. 31 sec. to 4 min. 30 sec.	20
5 minutes	11
6 minutes	8
7 minutes	12
8 minutes	6
9 minutes	3
10 minutes	4
11 minutes	4

The distribution of the errors was as follows:

Number of errors	*Number of subjects*
0	9
1	14
2	11
3	11
4	8
5	6
6	7
7	6
8	4
9	3
10	3
11	1
12	1
13	1
14	2
15	2
16 and over	3

[14] The Student "t" test is very widely used in all problems of comparison of means, in the case of small samples (from five to ten measurements, for example). The test permits the evaluation of the probability that these samples do or do not belong to the same parent population.

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Among several adult Whites Dr Heuse found mean performance times ranging from 1 min. 18 sec. to 2 min. 10 sec. For a group of neuro-psychiatric Whites the performance times were in excess of 2 min. 30 sec.

In the African Negro series, 10 per cent of the subjects made no errors, 15 per cent made one error, and 63 per cent made from two to ten errors. For the adult White series, the inverse occurred.

The *Bize Oval Test* (a mental ability and assembly test) was administered to a series of 90 Negroes. The test was completed in 15 minutes or less by 11 subjects, with an average time of 11 min. 45 sec. Fifteen minutes is the time at which White children from 11 to 14 years of age are eliminated. Standardized by Miss Pieron on a sample of 578 White French boys from 12 to 14 years of age,[15] this test eliminated 3.5 per cent of the latter and 88 per cent of the adult Negroes. The mean time for the White male children was 7 min. 52 sec. This mean time was attained by only two of the Negro subjects. One of the Negroes was an illiterate Foula who spoke five African languages in addition to Foula and French. His time of five minutes corresponds to the second decile of the White distribution. The other Negro was a Baoule who knew how to read and write. His time was 7 min. 16 sec., which corresponds to the end of the fourth decile or the beginning of the fifth decile of the White distribution.

It should also be noted that a certain number of Negroes were allowed to proceed with the test beyond 15 minutes. Of these 32 subjects, 15 Negroes succeeded in completing the test in the following times: one in 16 minutes, two in 19 minutes, two in 20 minutes, one in 21 minutes, one in 22 minutes, one in 26 minutes, two in 27 minutes, two in 30 minutes, one in 37 minutes, and two in 39 minutes. The other Negro subjects correctly assembled from two to seven parts of the test in times ranging from 16 to 44 minutes.

This test appeared of great interest to Dr Heuse. He suggested that it deserved to be employed in series[16] and to be administered to White adults.

The *Bonnardel Disc Test*[17] is a test of concrete intelligence, to which a perceptive factor is doubtless added. This test yielded very

[15] Miss Pieron also standardized this test on a sample of 354 White French girls from 12 to 14 years of age. The female group obtained higher test scores than the male group. The younger students had the highest scores.

[16] The P. Dufor Company in France plans to produce the test.

[17] The Bonnardel Disc Test consists, on the one hand, of ten discs with four holes, these holes being distributed in different fashion in each disc, and on the other hand, of a plate containing ten series of four spurs. For each series, the position of the four spurs corresponds to that of the four holes of one specific disc. The subject must place each disc on the matching series of spurs, these discs having first been completely randomized. It is then ten different configurations that the subject has to examine, and not just one as occurs in the Piorkowski test.

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good results in Dr Heuse's investigations. He recommended its employment by anthropologists.

The distribution of the test results for the group of 91 Negroes was as follows:

Percentile	1	10	20	30	40	50	60	70	80	90	100
Completion Time (in minutes)	1.31	2.45	4.6	5.8	5.41	6.31	7.27	8.24	9.21	11.20	14.2

The median was 6.35 minutes, the first quartile 4.34 minutes, and the third quartile 8.50 minutes.

Bonnardel (1952) has compared the disc test scores from different ethnic and national groups. The age-range was 20-30 years for the various groups, except in the case of the Vietnamese where it was 25 to 35 years. In Table 1 we have added our test results to those of Bonnardel, using the same form of presentation. The test is scored in minutes and hundredths of minutes, so that the lower the time the better the score.

TABLE 1

Average test scores of different ethnic groups on the Bonnardel Disc Test

Ethnic group	*Number of subjects*	*First quartile*	*Median*	*Third quartile*
Germans	502	2.35 mins.	1.68 mins.	1.30 mins.
Saarlanders	103	2.54 mins.	1.81 mins.	1.32 mins.
French (laborers)	944	2.80 mins.	2.00 mins.	1.50 mins.
Italians	107	2.78 mins.	2.02 mins.	1.60 mins.
Poles	126	3.19 mins.	2.23 mins.	1.66 mins.
Vietnamese	422	3.44 mins.	2.30 mins.	1.67 mins.
North Africans	743	5.55 mins.	3.52 mins.	2.36 mins.
African Negroes	91	8.30 mins.	6.21 mins.	4.20 mins.

It is worth noting that the racial and ethnic differences on this test are of such a magnitude, that for the Negro subjects overlapping is evident only with the North Africans. The best Negro test score was obtained by a fisherman—the only Bantu in the African series. His time of 1.31 minutes placed him in the first decile (or the ninth decile, according to the scale used) of Bonnardel's series of French laborers. However, the second best Negro time of 2.10 minutes must be placed in the neighborhood of the median of the French series.

The other Negro test scores under 3 minutes were the following: a Coniagui farmer (2 min. 10 sec.), a Toma Fetichist farmer (2 min. 15 sec.), a Foula farmer (2 min. 17 sec.), another Foula farmer

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(2 min. 30 sec.), a Mandingo driver (2 min. 45 sec.), a Mossi farmer (2 min. 45 sec.), a Djerma farmer (2 min. 45 sec.), and an Oulof farmer (2 min. 58 sec.). Dr Heuse believes that this distribution has an important psychological significance. It shows that the Bonnardel Disc Test is a true test of concrete intelligence and not merely a manual aptitude test, since all the best Negro scores except one were made by farmers. On the other hand, 28 Negroes had occupations which should have conferred to them a certain technical superiority.

The *Binet Cubes Test* is a test which consists of the ordering of five weights of 3, 6, 9, 12, and 15 grams each in boxes of the same appearance and the same volume. From the series of 90 Negroes, Dr Heuse obtained 40 good responses. This is equivalent to a level of 10-year-old White children. In the psycho-pathological White series Dr Heuse observed only one single error. This was made by a 28-year-old White farmer, who bordered on feeble-mindedness and whose memory of numbers was limited to two digits. However, in Bargny (French Overseas Africa), Dr Barbe found an average of only one error for 30 subjects.

The *Turning Test*[18] (test du tourneur) was administered to 32 Negroes from the series. This test of dissociation of movement is likewise a good test of concrete intelligence.

For speed of performance, measured in minutes and tenths of minutes, Dr Heuse obtained the following data, which are compared with the test results reported by Dr Bonnardel (Tables 2, 3, and 4) and by Dr Maistriaux (Table 5).

TABLE 2

Average test scores of different ethnic groups on the Turning Test: Speed

Ethnic group	*Number of subjects*	*First quartile*	*Median*	*Third quartile*
French (adults)	100	3.1 mins.	3.9 mins.	4.7 mins.
North Africans	50	3.9 mins.	4.9 mins.	5.6 mins.
Otomi Indians (Mexico)	87	6.4 mins.	8.5 mins.	11.7 mins.
African Negroes	32	7.4 mins.	9.4 mins.	10.8 mins.

[18] This test uses an apparatus composed of a sort of turning wagon with two crank-handles—the one permitting transversal displacements and the other longitudinal displacements. The subject must follow, with the aid of these hand-cranks, a rectilinear and curvilinear isolating trace to a needle on a metallic plate. All contact of the needle with the metallic part constitutes an error, whose number and duration are registered by electric computers. The experiment is timed.

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TABLE 3

Average test scores of different ethnic groups on the Turning Test: Number of errors

Ethnic group	*Number of subjects*	*First quartile*	*Median*	*Third quartile*
French (adults)	100	8	17	32
North Africans	50	31	42	55
Otomi Indians (Mexico)	87	32	54	86
African Negroes	32	7	14	22

Fortunately, the slowness in our African series was compensated by good performance, which was not the case with the Congolese Negroes tested by Dr Maistriaux.

TABLE 4

Average test scores of different ethnic groups on the Turning Test: Average duration of errors

Ethnic group	*Number of subjects*	*First quartile*	*Median*	*Third quartile*
French (adults)	100	7	13	29
North Africans	50	25	43	62
Otomi Indians (Mexico)	87	55	108	196
African Negroes	32	78	227	381

The total duration of errors brings out the slowness of the psychomotor tone of the Negro. This slowness was already observed in the study of reaction times and in tapping tests.[19] The average duration of errors is expressed in tenths of seconds.

TABLE 5

Average test scores of different African Negro groups on the Turning Test

Ethnic groups	*Number of subjects*	*Mean time in seconds*	*Mean number of errors*
Congolese Negroes:			
from the bush (Kikumba)	51	617	—
Bukavu College (Congo):			
2nd, 3rd and 4th grades	42	697	63
5th, 6th, and 7th grades	71	812	71
Apprentices in formation:			
Leopoldville, Belgian Congo	60	621	72
Brazzaville, French Congo	171	520	27
French African Negro Soldiers	32	544	14

[19] See Georges A. Heuse, "Neurologie et Psycho-psysiologie," *Biologie du Noir*, Problemes d'Afrique Centrale, Brussels, Belgium, 1957, pp. 115-153.

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Dr Heuse contends that *suggestibility* offers a subject of special interest in anthropological psychology, since it measures well the nervous and mental tone. Primary suggestibility, which is linked to hypnotizability, was investigated with the aid of the Chevreul exploratory pendulum and the body oscillation test described by Hull.[20] In a series of 79 Negroes, 45 per cent were suggestible to the pendulum. Among 72 Negroes, 57 per cent were suggestible to the body oscillation test.

Secondary suggestibility was studied with the aid of the Binet line test. Fifty out of 80 Negroes, or 63 per cent were suggestible. In the Binet scale this is equivalent to a test of resistance at the 12-year-old level. Dr Young (1929), the American psychologist, found 46 per cent of American Negro subjects suggestible in contrast to 10 per cent of American Whites. Dr Heuse sees here evidence of a racial difference between the Negro and the White. He concludes that the difference in test performance between the American Negroes and the African Negroes can be explained by only one factor—race-crossing.

Evidence of the diversity of the types of suggestibility is afforded by the fact that 16 of the 70 Negro subjects were suggestible to the three tests. Seven of the 70 subjects were not suggestible to any of the three tests. Twenty-six of the 70 were suggestible to two of the tests and 21 to one of the tests.

Extraversion and introversion were also studied. The psychological orientation of the African Negro subjects was ascertained by direct contact lasting some ten hours, rather than by answers given to the frequently inadequate questionnaires. In order to avoid all risks of error, the doubtful cases, which generally resulted from linguistic difficulties, were eliminated from the test data. This left 73 Negro subjects.

Frank and unrestricted extraversion was observed in 72 per cent of the African Negro subjects. A dominant extraversion with slight secondary introversive tendencies was found in 18 per cent of these subjects. A dominant introversion with slight secondary extraversive tendencies was found in 7 per cent of the group. Finally, frank and unrestricted introversion was observed in 3 per cent of the series. Hunter (1937) found 28 per cent of a group of American White subjects and 17 per cent of a group of American Negro subjects to be introverts. Dr Heuse found the proportion of African Negro introverts to be less by 10 per cent. Without doubt he concluded that this difference between the African and American Negroes

[20] The explanations concerning these two tests can be found in the "Psychological Techniques and Instructions" appendix to "Etudes Psychologiques sur les Noirs Soudanais et Guinéens," *Revue de Psychologie des Peuples*, Vol. 12, No. 1, 1957, pp. 61-65.

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can also be explained in part by race-crossing. In this case also, Dr Heuse assigned the value of an element of psycho-racial diagnosis to this difference of frequencies.

Color preference has been the object of a certain number of differential studies in the United States. Thus, Mercer (1925) found among 1000 American Negroes the following order of preference (from the most preferred to the least preferred): blue, orange, green, violet, red, yellow, white. On the other hand, American Whites expressed the following order of preference: blue, green, red,[21] violet, orange, yellow, white. Hurlock (1927) investigated the color preference of 194 Negro children and 206 White children in the United States. The two colors preferred by both groups were blue and rose.

These American investigations are very interesting since they are in complete opposition to all European studies. It was thought that Negroes were less sensitive than Whites to colors of shorter wave-lengths (3900 to 5200 Angstrom units: yellow, orange, red). In fact, many other ethnic groups (Nubians, Toda, etc.) are comparable to the African Negroes and their languages do not even distinguish between green and blue, for example.

It is of great interest to recall that in the time of Homer, the Greek language was characterized by a similar poverty and embarrassment. Certain authors (Gladstone, Geiger, Magnus) have even advanced evolutionary, and sometimes physiological, theories, which have been justly criticized by Geoffroy (1882). Let us remember that in general red and yellow occupied a privileged position in the theory of colors in the world of Classical Antiquity.

Professor Guenther (1929) considers that the "psychic" colors of the Mediterranean race are red and yellow, those of the Nordic race blue and green, those of the Alpine race violet and maroon, etc. Dr Limper, in a study conducted in Germany, found that blonds are at the same time more oriented toward introversion and show a greater preference for the colors blue and green. On the other hand, brunets exhibit a more extraversive orientation, together with a preference for the colors red and yellow. Professor Jaensch (1933) links possible racial differences to geo-psychological factors.

The psychologist suspects with good reason a relationship between personality types and color preferences. We already know of many practical applications in industrial psychology and psychiatry. Dr Luescher (1949) in particular has contributed to the study of this relationship. At an international conference held in Ouchy, France in September 1947, he presented a psychodiagnostic test. This test is based on a choice between seven colors, including the four basic colors (yellow, red, green, blue) and grey, black, and white,

[21] These first three colors are also the colors preferred by French Whites, and in the same order (*Réalités*, No. 119, December 1955, p. 82).

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on the one hand, and between four shades of the same category, on the other hand. Red is supposed to indicate "erotic aspirations or a compensatory zeal and other peculiarities." Yellow is the color "which is most striking and self-asserting. It represents then the tendency to draw attention, to face publicity. The most frequent form of this 'nervous sensibility,' the original cause of many neuroses, is expressed by a need for sensational experiences, accompanied by a feeling of anxiety with respect to the surrounding world." All this may be true. However, Dr Heuse remained skeptical of the accuracy of Luescher's deductions. He preferred a simpler test based on the colors of the spectrum, to which black, grey, and white could have been added.

In the African Negro series, the simple test was administered to 77 subjects. Thirty per cent of the subjects preferred red, 26 per cent yellow, 18 per cent blue, 12 per cent green, 6 per cent orange, and 5 per cent violet. Finally, two subjects or 3 per cent refused to answer.

In the control test, which was administered to 24 subjects, 49 per cent of the subjects expressed the same choice of colors after an interval of eight hours. The other subjects changed from red to orange, to yellow, to green, to blue, or from blue to yellow, or to green, or from yellow to violet, to red or to orange, from violet to yellow, from green to yellow.[22]

Four subjects were asked to arrange the six colors used in order of preference. One subject twice repeated the same order of preference after an interval of eight hours. This subject was a Foula with an average memory. For two other subjects, the first two colors remained the same. The last subject changed his first preference from green to yellow.

Dr Heuse noted that the lack of constancy in a good proportion of the subjects threatens to invalidate a test of choice, unless the test is repeated twice at time intervals as distant as possible (a week or a month, for example). Conversely, he also concluded that the lack of constancy itself deserves to be studied, since it indicates certain aspects of personality.

Garth and Porter (1934) compared 1032 White children less than seven years of age with 1000 White children more than seven years and found interesting differences in color preference. Among the younger children, the order of preference was: red, blue, orange, green, violet, yellow, and white. Among the older children, the order was: blue, green, red, violet, orange, yellow, and white. This variability as a function of age, if confirmed by further studies, could easily provide support for a psychogenetic hypothesis.

In general, Dr Heuse's study confirmed the natural attraction of the African Negro to the colors of longer wave-length.

[22] In each case it was a question of only one subject, except in the change to green which was made by two subjects.

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The *Automatic Kinesigraph*[23] was conceived and built from the so-called "Reglette de Carrard" test. It is used as a test of "cross-checking" ("recoupement"). It seems to provide useful indications in the determination of certain factors of character and emotion.

The tracings of 74 African Negroes were collected. A blind interpretation by Dr Alquier was the subject of a special report.

EVALUATION OF PROJECTIVE TECHNIQUES

The projective techniques most frequently employed in cultural anthropology[24] are the Rorschach test[25] and the Murray Thematic Apperception Test.[26] Tests of free drawing and copies of drawings (the *Bender Gestalt Test*, the *Prudhommeau Test*) and doll tests (*Doll Play*) are also used.

While ethnologists, such as Hallowell, have accepted the universal validity of the Rorschach test, some psychologists have expressed reservations which must be considered here. Lantz (1948), for example, justly fears the lack of psychological training of many ethnologists. He criticizes the hazardous speculations which the ethnologists sometimes make, in seeking to find among the Rorschach protocols certain indications, which the test itself does not purport to give.

Dr Heuse believes the observations of Professor Cook (1942), who studied the natives of Samoa, to be no less pertinent. This psychologist contends that the high percentages of F (form-response) do not necessarily indicate meticulousness or depression, since the Samoans are by nature very formal.[27] The percentage of

[23] The automatic kinesigraph was conceived and built from the so-called "Reglette de Carrard" test, in order to eliminate the moving influence of the operator. The subject, eyes closed, traces lines on a paper which is unrolled at a uniform speed. The analysis of the tracings (degree of pressure, steadiness of the hand, direction of gesture, rhythm) constitutes a test of cross-checking ("*recoupement*") in the determination of factors of character and emotion.

[24] In the United States, where these investigations have been initiated, the branch of cultural anthropology which is concerned with ethno-psychology is termed "personality and culture studies."

[25] The Rorschach test is simple in its principle. The test consists of ten plates, each one reproducing an ink spot, in black and white or in color. The ink spot is obtained by spilling ink in the center of a sheet of paper and then folding this sheet in the center. The plates are presented successively to the subject, who is asked what he sees. According to Frank, the Rorschach test is a type of *constitutive* projective technique. In effect, the material used is nonstructural and plastic.

[26] Let us recall that the Thematic Apperception Test (T.A.T.) consists of the interpretation by the subject of a series of drawings (usually numbering 30 plates) representing scenes of one or more persons, and of ambiguous significance. This test is a type of *interpretative* technique, according to the classification of Frank. The subject must interpret an experience or a constitution having an affective significance.

[27] It remains to be seen whether this trait is not precisely one of those elements of the deep-seated personality, which is revealed by the Rorschach test. What the ethnologist must possess above everything else is a sense of psycho-pathological relativity.

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color-responses cannot be evaluated without knowing that white is the preferred color in the Samoan Islands and that the color vocabulary is very poor in the Samoan language, as it is also in the tropical regions. In addition, the percentage of animal-responses must be completely re-evaluated for the African Negroes, in particular, in order to have any significance. Finally, the Rorschach test in itself is a universal test, but the evaluation of the responses presupposes a preliminary empirical knowledge of the basic personality of the ethnic group in question.

The most systematic study of the African Negro was carried out by Dr Peiffer (1955). On the basis of 324 protocols,[28] Peiffer reports that the probable "lines of force" of the Rorschach, when the test is administered in an *objective* manner, are for the French African Negroes, the following:

African Negro Rorschach Responses

Mean number of responses	Approximately	5
Percentage of D-responses	,,	50 per cent
Percentage of F-responses	,,	80 per cent
Percentage of A-responses	,,	65 per cent
Percentage of responses to Plate VIII	,,	18 per cent

Dr Peiffer also conducted an excellent study on the effects of leprosy on the African psyche, likewise employing the Rorschach test.

Rorschach protocols were obtained from ten subjects in Dr Heuse's African Negro series. These protocols were the object of a blind interpretation by a specialist and have been published separately.

While the principle of the Thematic Apperception Test is in itself universal, the material is not. In fact, the plates which comprise the test represent personalities and situations which are culturally very specific. The Murray T.A.T., valid for Euro-American Whites, has been successively adapted by Thompson (1944) for the American Negroes and the Amerindian Hopi, by Lee (1953) for the African Zulu Negroes,[29] and by Ombredane (1954) for the African Bantu Negroes.

Dr Ombredane also made an important study of the Bapende and Basuku Negroes of the Belgian Congo in which he obtained Rorschach protocols from 40 subjects. This study was published by the Belgian Royal Colonial Institute. Ombredane demonstrated well the variability of the group before the problems of subsistence, adultery, sickness and fetiches, lemba,[30] marital relations, and work. The T.A.T. appears then as a very adequate ethno-psychological test,

[28] Personal communication from the author (July, 1954).

[29] The adaptation has also been recognized as valid for the Basuto, the Ovambo, the Fingo, the Xhosa, the Tswana, the Griqua, and the Amaswazi.

[30] The *lemba* is the maternal uncle, a "protective-exploitative" being.

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even if one is not entirely satisfied with the complexity of interpretation on the individual plane and the lack of information on certain personality traits. Dr Ombredane, moreover, refrained from drawing any conclusions. On the plane of comparative personality, the author restricted himself to writing a page and a half on the persistent extraneity of the super-ego, "a striking phenomenon which is manifested among the Negroes." One is undoubtedly pleased that the T.A.T. uncovers this disposition in the subconscious of the African Negro. However, this will teach nothing new to those who have some ideas about the institutions of the Negro. The primary concern of Dr Ombredane's study is essentially ethno-psychological. Dr Heuse believes that it confirms, by an experimental method in depth, the empirical observations. This is not a negligible feat.

In the present state of comparative research, Dr Heuse concludes that the T.A.T. is a synthetic test, which reveals primarily the basic personality of ethnic groups. It is the true test of ethno-psychology. In contrast, the Rorschach is an analytic test, which reveals primarily the personality of the individual. It is the true test of anthropo-psychology. The two tests are complementary, responding to two different objectives. Hence they can be used simultaneously to advantage.

EVOLUTION AND PROBLEMS OF PSYCHOLOGICAL ANTHROPOLOGY

In the final section of his paper on the psychological studies on the Sudanese and Guinean Negroes, Dr Heuse discusses the evolution and problems of the science of psychological anthropology (*l'anthropologie psychologique*). He describes this science as one of the disciplines of differential psychology. Furthermore, as a science of synthesis psychological anthropology it is held to require "a balanced knowledge extending to all the other anthropological disciplines and to several natural sciences."

In his review Dr Heuse observes different trends in the evolution of contemporary anthropo-psychology (i.e., that science which utilizes testing procedures). The first trend was dominant between the two World Wars. American psychologists in this period devoted themselves to the comparison of intelligence quotients of different racial and national groups, with the aid of tests of development. Dr Heuse views work in this period as a lively battle "between the grandchildren of the last slave-holders and the egalitarian liberals." However, in the end the science of anthropo-psychology is seen as the only loser, since "the investigators tended more or less consciously to prove the validity of their underlying convictions."

Dr Heuse then notes that at the beginning of the Second World War, "ethnologists and social psychologists applied themselves to the study of national character, on the reality of which most of them

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agreed." At this time, racial psychology is viewed as having fallen "into oblivion, if not into discredit."

After the end of the Second World War, "the United Nations began a war on racism, first through the medium of the U.N. Economic and Social Council and then through Unesco." However, in the view of Dr Heuse: "Owing to certain blunders, this soon turned out to be a war on anthropology itself." Examples cited by Dr Heuse are Ashley-Montagu's description of race as a "social myth" and Otto Klineberg's categorical conclusion of a Unesco pamphlet with the words: "Science does not reveal any relation between race and psychology."

Dr Heuse evaluates Otto Klineberg's research and writings in the field of anthropo-psychology in the following manner:

> The influence of Klineberg in Europe has been great. The Belgian psychologists, Ombredane, among others, supported his views. Although he succumbed to egalitarian dogmatism, Klineberg has the merit of having criticized the inadequacies of racial psychology between the two world wars. In particular, he demonstrated the non-existence of global intellectual differences between the Nordic, Alpine, and Mediterranean sub-races and the influence of environment during the American studies on immigrants and on rural Negroes. On the other hand, Klineberg must be reproached for having limited himself to studies of global intelligence and for having neglected therefore studies of specific aptitudes as well as of the neurological foundations, for having superficially studied racial personality traits under questionable experimental conditions (for example, using immigrants as subjects—the same group of subjects he denounced in reference to comparative I.Q. studies as not being representative of their ethno-racial group), of having failed to recognize group psychological heredity at the level of the race while recognizing it at the level of the family (although a race is a multi-family group), and of having labored systematically against anthropology in his book *Race Difference*, going so far as to pass over in silence the most evident anatomical and pathological racial differences.

The American trend in anthropo-psychology was in turn succeeded by the European trend. British, South African, French, Belgian, Spanish, and Portuguese psychologists began to study the psychology of the African Negro. This work was reviewed by Dr Heuse in his book *L'Anthropologie Psychologique* (1955) and in two previous articles, "Fondements et Problemes de L'Anthropologie Psychologique" (*Revue de Psychologie des Peuples*, Vol. 7, No. 1, 1952, pp. 62-85) and "La Psychologie des Noirs Africains" (*Problemes d'Afrique Centrale*, Vol. 7, 1954, pp. 169-194). Some of these investigators continued to employ scales for measuring mental

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age (Gonzales, Augusto, Barbe), although at the same time making certain necessary adaptations to African conditions (the Gille Mosaic Test). Other investigators (Maistriaux, Ombredane, Biesheuvel) set up batteries of performance tests, which Dr Heuse regarded as "incontestably preferable."

According to Dr Heuse, Biesheuvel did not find any difference in performance between 125 South African Whites and 125 South African Negroes on certain sub-tests (maze, pass-along, matching) and Augusto found the performance of Mozambique Negroes superior to that of Portuguese Whites on several sub-tests (notably, figure gaps and digit memory). However, on the whole the results of all these studies are in agreement in demonstrating that "the aptitudes of the Negroes, measured on tests of Whites, are on the average quantitatively considerably less developed."

Dr Heuse draws the following conclusions from these data:

> We consider it to be a fact that certain aptitudes (memory, attention, abstraction), which are part of the Euro-American concept of global intelligence, are on the average less developed in the Negro than in the White. This is a differential phenomenon, which certainly has a genetic, anatomical-physiological foundation.
>
> However, this innate racial group difference is not large enough to allow us to speak of absolute inequality.[31] The concept of absolute racial inequality, if it exists, could be applied only to the Australian aborigines and even more surely to the Veddoids.[32] This is a difference which tends to disappear when the adaptation of Man to his specific milieu is considered. In the tropics, the Negro may rightly consider abstraction as an epiphenomenon. His memory and his attention are specific. They may not be in accord with the criteria recognized as valid for the White. Furthermore, it is known that there are several kinds of memory rather than one specific aptitude. It may be that the mnemonic system of the Negro, whose criteria were ignored in the construction of the tests, differs qualitatively from that of the White, if only because of the fact that the passage of time is experienced differently among those populations whose traditions are oral.

[31] Of *absolute* inequality, at least. However, a factual inequality may be manifested when transplantations and migrations bring together very different human groups. See Georges A. Heuse, "Race, racismes, antiracismes," *Revue de Psychologie des Peuples*, Vol. 10, 1955, pp. 368-381.

[32] The Veddoids comprise the Vedda of Ceylon, the Senoi of the Malacca peninsula and of the coastal region facing Sumatra, the Toala of the Celebes Islands, and various groups in the jungles of India. The position of the Vedda in anthropological systematics is in dispute. Professor Montandon classifies the Vedda with the Australian Aborigines and maintains the existence of a Veddoid-Australoid primary race.

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The hypothesis of qualitative racial differences is also evoked by Dr Heuse, although he is not certain that this concept is justified. He believes that the Belgian psychologist Maistriaux makes a good point in applying himself to an examination in depth of the qualitative aspect of the mental attitude of the African Negro. Upon further examination, Dr Heuse finds that Haldane's distinction between quantitative differences and qualitative differences is not as evident as it appears. He contends that if structural mental differences with qualitative effects are observed, the quantitative differences will lose *de facto* all significance.

Dr Heuse observes that "it is true that differential psychology—a science invented by the White—tends to place the Negro below the White norms." He further states that "it is not by denying these *facts* that the egalitarian will succeed in combating racism; it is the differentialist who will succeed in demonstrating the existence of relativistic racial differences."

In the course of a meeting of experts on the problem of knowledge of foreign countries sponsored by U.N.E.S.C.O. in the spring of 1955, Dr Stoetzel described the ethno-psychological differences between Europeans and Japanese as *irreducible*. Dr Heuse also finds this irreducibility between the Negro and the White. However, for both writers, this concept is differentialist in nature. In the view of Dr Heuse, "the psychological differences between the primary races of man are of the magnitude as Carl Jung found between the sexes."

Dr Heuse recommends study of the neuro-physiological foundations and of the elementary psycho-physiological structures as among the primary future tasks of the anthropo-psychologist. He contends that as long as these studies are not undertaken, "it is necessary to use the available material on mental structure with the utmost caution." Dr Heuse also finds global intelligence to be an "inadequate criterion in racial psychology, since it gives rise to multiple confusions." He believes that a more suitable orientation in this discipline might consist of the study of fundamental aptitudes, such as memory and attention, on the one hand, and the study of elements of personality, on the other hand. Finally, Dr Heuse recommends that the anthropologist should also be a geneticist, since anthropo-psychology cannot develop without progress in neurological genetics and in psychological genetics.

Since anthropo-psychology is a discipline of synthesis, the use of various methods is surely necessary. However, there is one method, at least, which in the view of Dr Heuse demands great caution: the psychoanalytic method. In previous articles Dr Heuse advanced the thesis that the White appears oriented toward the "ego"—the site of conscious perception and conscious action—the Negro toward the "id"—the site of instinctive drives—and the Oriental toward the "super-ego"—the site of moral censure. In the case of the

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Negro, the "super-ego" is exterior to the individual, being a collective and social "super-ego." Such a generalization, which is rather akin to philosophical anthropology, is of no consequence in the work under review.

Projective techniques are psychoanalytical methods which appear very valuable to Dr Heuse. However, he finds psychoanalysis disturbing "when it purports to explain collective personality on the basis of customary events of early childhood." Dr Heuse cites as an example Ritchie's (1943) belief that "the drama of weaning is at the origin of the personality of the Negro." In this view, the mother would be hated in the subconscious, giving rise to the attitude of the adult Negro toward women—a phallic narcissistic attitude. The father is equally hated, but the hatred is transformed into fear, giving rise to the fear of all forms of masculine authority.

According to Dr Heuse, the Belgian psychologist Ombredane (1954) appears to believe such an explanation. However, J. C. Carothers (1954) thinks that Ritchie exaggerates the importance of the infantile experience. In addition to the evidence itself, Dr Heuse believes that one other observation should be added which is not negligible. That is the affection and constant solicitude of the parents toward the children which is one of the most consistent traits of the ethnography of the Negro family. Dr Heuse contends that if the children are unable to find in this affection a compensation for their infantile deception, then this would be due to the small worth of their conscious life in relation to their unconscious life. However, this would be a conception almost as absurd as that which would hold that the unconscious does not act in any way on the conscious. For his part, Dr Heuse believes that "the subconscious evolves gradually with conscious experiences and that nature habitually does the work of the psycho-therapist; for otherwise, there would be only unbalanced people."

SUMMARY

The development in the twentieth century of differential psychological methods and techniques has enabled scientists to compare racial and ethnic groups throughout the world on a variety of measures of behavior and mental ability. The vast majority of these studies have been conducted on samples of Whites and Negroes from the United States. On tests of intelligence the mean difference between American Whites and Negroes has been found to be some 15 to 20 I.Q. points, with the difference remaining constant throughout a 50-year period.

Comparative psychological studies have also been conducted on samples of African Negro populations by scientists from several different European countries. Some of the most important research in this field was undertaken by the Belgian scientist, Dr Georges A. Heuse. During the early months of 1955 Dr Heuse and his associates

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carried out an intensive investigation on some 100 healthy Sudanese and Guinean Negro soldiers from the French army. Anthropometric, morphological, biochemical, physiological, psycho-phyisological, and psychological studies were conducted on these subjects. The psychological research comprised investigations of racial differences on tests and measures of perception, memory, attention, performance and development, and personality.

Perception was studied in two of its aspects—anomalies of visual perception (employing nine different optical illusions) and keeness of weight perception. With regard to visual perception, the African Negro sample proved more resistant to the illusion in each case than a European White sample. These results may indicate different modes of perception in the two racial groups. With regard to keeness of weight perception, the median error of the Negro sample was substantially higher than the median error in a series of White French school pupils. This test was recommended to anthropologists by Dr Heuse as a measure of concrete intelligence.

Several different types of memory were investigated by Dr Heuse—memory of forms, memory of rhythm, memory of colors, concrete memory, memory of time, and memory of numbers. In each case the mean African Negro test performance was substantially below the mean test performance of a comparable European White sample. On some memory tests the African Negro performance was below that of White samples sub-normal in intelligence or hospitalized for psychiatric disorders and epilepsy. On the basis of these test results, Dr Heuse estimated the memory of the African Negro "to be approximately 80 per cent of the memory of the White Euro-American."

Attention was measured by means of a test consisting of the crossing-out of 250 well-defined signs on a page of 40 lines. Only 14 per cent of the African Negroes reached or surpassed the mean score of the normal White series, while 30 per cent attained or surpassed the mean of an abnormal White series. An analysis of the behavior of the Negro subjects during the test revealed "a notable weakness of mental tone in the face of an unaccustomed task."

Performance and development were investigated by means of five different tests—the Porteus Maze Test, the Bize Oval Test (a mental ability and assembly test), the Bonnardel Disc Test (a test of concrete intelligence, plus a perceptive factor), the Binet Cubes Test, and the Turning Test (a test of concrete intelligence). On the Porteus Maze Test, the African Negro series took substantially more time to complete the test and made far more errors than a comparable adult White series. On the Bize Oval Test, only two of the series of 90 African Negroes attained the mean time of the standardized sample of 578 White French boys from 12 to 14 years of age.

On the Bonnardel Disc Test, the median time for completion of the test for the African Negro series was 6.21 minutes, while the

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median time for five European White series ranged from 1.68 to 2.23 minutes. On the Binet Cubes Test, the performance of the series of 90 African Negroes was equivalent to a level of 10-year-old White children. On the Turning Test, the median time for the African Negroes was 9.4 minutes compared to a median time of 3.9 minutes for a series of 100 White French adults. The "average duration of errors" score (African Negroes = 227 and French Whites = 13) was regarded by Dr Heuse as revealing of "the slowness of the psychomotor tone of the Negro." This slowness had been previously observed by Dr Heuse in the study of reaction time and in tapping tests.

Personality was studied in three aspects—primary and secondary suggestibility, extraversion and introversion, and color preference. Three tests were employed to investigate suggestibility—the Chevreul exploratory pendulum, the Hull body oscillation test, and the Binet line test. Forty-five per cent of the African Negroes were suggestible to the first test, 57 per cent to the second test, and 63 per cent to the third test. These were substantially higher percentages than found in samples of European or American White subjects.

Extraversion and introversion were studied by direct contact, rather than by a questionnaire. Frank and unrestricted extraversion was observed in 72 per cent of the African Negro subjects, while frank and unrestricted introversion was observed in only 3 per cent of the subjects. A far higher proportion of introverts has been found in samples of White subjects. With regard to color preference, Dr Heuse confirmed previous reports of a natural attraction of the African Negro to the colors of longer wave-lengths—i.e., red and yellow.

On the basis of his research, Dr Heuse concluded that "certain aptitudes (memory, attention, abstraction), which are part of the Euro-American concept of global intelligence, are on the average less developed in the Negro than in the White." He considered this a differential phenomenon, "which certainly has a genetic, anatomical-physiological foundation." Altogether, Dr Heuse's psychological studies on the Sudanese and Guinean Negroes constitute an important contribution to the science of anthropo-psychology. They provide further evidence that the evolutionary forces which have differentiated the primary races of man in anatomical, physiological, and biochemical traits have also operated to produce fundamental racial differences in mental and behavioral traits.

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The Origin of the Clan Mackay

By ROBERT L. MACKAY

That authoritative map, "Scotland of Old,"[1] by Sir Iain Moncreiffe of that Ilk, and Don Pottinger, shows the general sphere of influence of each Scottish clan about the reign of James VI, i.e. 1567-1625. Looking at the map, I have often wondered how the quite numerous well-known Clan Mackay came to occupy that part of Scotland, nearest to Ultima Thule, and furthest away from all centres of culture, learning and government in Great Britain.

Highland wit and Lowland humour can produce many reasons for this apparent banishment. Here, I am interested in determining only the basic factors or forces which made it inevitable that the Mackays should have to live, for a time at any rate, in the most distant part of our land, from early days.

It appeared to me that a study of the reputed origins and even of the characters of the principal clans associated with Sutherland and the areas around, plus an examination of their relations with the rulers of Scotland, and with each other, might yield an acceptable explanation, and show the forces involved.

THE HISTORICAL BACKGROUND

From the days of St Ninian, born about 350 A.D., the Picts—the name given to the inhabitants of Scotland then—were subjected to successive invasions of Scots (Gaels) from Ireland. These in time subdued and then intermarried with the natives, the population spreading thinly over the land. By 843 A.D., Kenneth MacAlpin, a Scot of Dalriada (Argyll) succeeded in ruling, nominally, over the land north of the rivers Clyde and Forth. His position was insecure, for, from about 800 A.D., the Norsemen or Vikings were harrassing the Hebrides, and other Western Isles and coasts as far south as the Isle of Man. Plunder first and then settlement were their aims. Merging and mating with the Pict-Scot amalgam for over four centuries, these invaders must have transmitted to their offspring, especially in the western areas, their love of the sea and their thirst for adventure, a lively imagination, a capacity for aggressive organisation with great mobility. When their last invasion was repulsed in 1263, there were left behind many words connected with the sea, ships and shipping tackle, as well as place names and personal names, to be added to our language.

The clans began slowly to evolve around the reign of Malcolm III (Canmore), 1057-1093, and his English wife, Queen Margaret. Before then, there were in the Highlands loosely organised groups

[1] Bartholemew, Edinburgh, 1961.

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of folk, living in separate valleys, or around sea lochs, or in mountainous regions, each recognising the authority of some more dominant personality, elected as tribal chief or *toiseach*. These folk knew each other by Christian name rather than by family name. The chief became in the minds of his followers, and in a symbolic sense only, the father of his tribe or clan, their protector, and often their judge when quarrels arose within the clan. The land was owned by the clan and not by the chief. In the next century or two, changing circumstances, feuds, alliances, the challenges and commands of sovereignty from the south and west, all influenced the strength and character of the clan. Often a clan was joined by landless men, fugitives from justice, men fearful of blood revenge ready to transfer their loyalty to another clan in exchange for protection. Such men took the clan name, although there was no blood relationship between them and the chief.

THE HIGHLAND SCENE IN THE TWELFTH CENTURY

In this period, what was becoming known as the Province of Moray extended from the western borders of Aberdeenshire, westward over the counties of Banff, Moray, Nairn and Inverness, and over the Great Glen into Ross and Cromarty. In this region, tribal groups were gradually forming into rather ill-defined clans, the principal ones being Morgan (later Mackay), Sutherland, Murray, Ross and Munro, a population of Pict-Celt-Scot origins, now fairly thoroughly intermarried. Here, the Viking or Norse element was not as prominent as in the west.

In the Province, these emerging clans, while often at strife with others, were, for upwards of 150 years, uniting under provincial leaders in more or less continuous rebellion against the spreading authority of the kings of Scotland, based near Perth. Among many causes for grievance, the chief one was that the Monarchy was bringing into Scotland, and into the Province, Norman and English nobles and officials who were receiving grants of land under the feudal system. Briefly, the Crown was taking over land which up till then belonged to the people, the clansmen.

In the absence of reliable records the identity, names and dates of the progenitors of most clans remain matters for conjecture. The student has to accept the agreed or majority opinions of those many critical historians who have devoted a life-time to study and research on this subject. It is sufficient for my enquiry to select those clans with the largest numbers resident in Sutherland in the year 1745. These form four distinct groups. In the west are the island-bred Macdonalds and Macleods with their off-shoots, the Mackenzies and Mathesons; in the north-east, the Gunns; and in the south, the Rosses and Munros. In the period dealt with in this essay, and still more or less in the Province of Moray are the Mackays (Morgan), Murrays and Sutherlands, with the Forbes in nearby Aberdeenshire.

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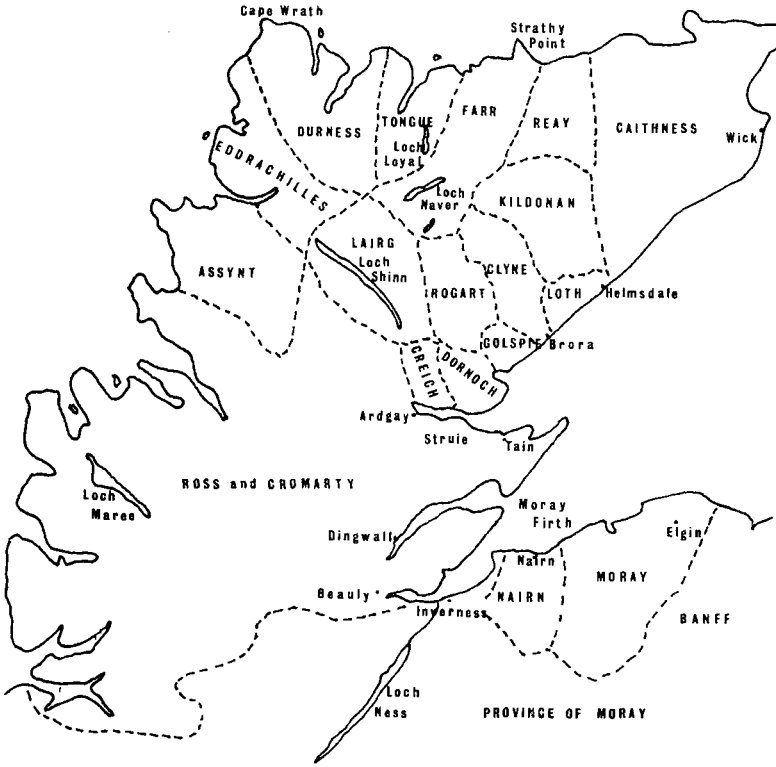

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To illumine my text, by the kindness of the author and his publishers, Secker and Warburg, I am able to show the Parish Map of Sutherland copied from John Prebble's book, *The Highland Clearances*.

THE CLANS TO THE WEST OF SUTHERLAND

The Macdonalds are the oldest, most powerful and most famous of all clans, and of mixed Scot-Viking origin. An early hero was Somerled, (Norse for mariner), Lord of the Isles. He died in battle against King Malcolm IV in 1164. Earlier he had driven out many of the Norsemen who had established themselves in his territory. The leaders of this clan seem to have organised it thoroughly for purposes of war for several generations. They held Lewis, Uist and the Isle of Skye, and on the western mainland they established "colonies."

The Macleods, of Norse descent, take their name from Leod, son of Olaf the Black, King of Man and the North Isles. He died about 1210. King David II (1329-1371) confirmed by charter to Torquil, fourth Chief of Macleod, the Barony of Assynt. It is possible that this acknowledged a *fait accompli* of many years earlier, namely, an occupation of mainland territory of the pattern shown elsewhere by their seniors, the Macdonalds. In this connection, an extract by R. J. Adam[2] from *John Home's Survey of Assynt in 1774* is relevant. "Macleods and Mackenzies, taken together, far exceed the other named tenants. 138 Macleods and 91 Mackenzies comprised 58 per cent, and in only five farms did neither name appear." Adam Gunn and John Mackay[3] remarked that Assynt has a dialect quite different from Reay and the rest of Sutherland.

These two clans, sharing Viking genes, encastled on their islands, with outposts on the mainland, were bold, outward-looking. The sea was their highway. Their folklore was rich in the fairy element, their songs lilting, haunting. They bred sailors, and later, a few admirals. The crest badge of the Macdonalds showed a hand in armour holding a cross, and above, the words *By Sea and Land.* Their shield displayed a black, oared ship with red sails. The crest of the Macleods showed a black bull's head, and the command *Hold Fast*. And this they did, especially in Assynt, a matter of subsequent importance to the Mackays, whose early historian[4] described them as "a fierce, strong, hardy race, and fit instruments for any desperate enterprise."

The Mackenzies, grouped here as of the west, are not very important to my thesis. They and the Mathesons had to acknowledge the authority of the Macdonalds. Later, these Mackenzies acquired most extensive territory south of the county of Sutherland. The foregoing quotation about Assynt would suggest an early penetration

[2] R. J. Adam, *John Home's Survey of Assynt in 1774*, Scottish History Society, 1960.

[3] Adam Gunn and John Mackay, *Sutherland and the Reay Country*, 1897.

[4] Robert Mackay, *The House and Clan of Mackay*, Edinburgh, 1829, p. 144.

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of that parish by Mackenzies. The Mathesons, on the other hand did not reach central Sutherland until the fifteenth century.

THE CLAN GUNN IN NORTH-EAST SUTHERLAND

Highland scholars can best describe this interesting clan. Gunn and Mackay:—[5]

> It seems that in olden times, the Gunns, as tradition holds, were stronger and more formidable in Caithness than the scanty references to them in the National Records would have us believe. As the Gunns did not hold land directly of the King, or by charters which passed the Great Seal, they are hardly referred to at all. The Gunns, knit together in the bonds of brotherhood, and cherishing ill-concealed hostility to those who had dispossessed them of an ancient heritage, were a serious menace to charterholders apprehensive of lawlessness. In times of confusion, might is often right, and the Gunns had too much of the former, as the Keiths and Oliphants feared.

Sir Iain Moncreiffe and David Hicks:[6] "They descend from Gunni of the Norse Saga of the Orkney Isles. Their eventual homeland was Kildonan, a buffer state between the Earls of Caithness and Sutherland." Moncreiffe does not mention a Pictish origin. Ian Grimble[7] mentions the possibility that the ill-endowed Gunns are a remnant of the Picts, forced beyond the Scarabens and into the barren hinterland of Ben Griam. Robert Bain[8] ascribes their origin as from Olaf the Black. *Gunnr* is Norse for war. Sir Robert Gordon,[9] 1580-1656, reports:—

> The Clangun are a race of people duelling within the dyocie of Catteynes, and are divyded among the three countries of Southerland, Catteynes, and Strathnaver. They are verie couragious, rather desperat than valiant. They have such intelligence and correspondence among themselues, that they will run all one course when any of them is pursued in either of these countries.

The phrase "a race of people" seems to imply that the Gunns[10]

[5] Adam Gunn and John Mackay, *op. cit.*, p. 169.

[6] Sir Iain Moncreiffe of that Ilk and David Hicks, *The Highland Clans*, London, 1967, p. 160.

[7] Ian Grimble, *Chief of Mackay*, London, 1965, p. 43.

[8] Robert Bain, *Clans and Tartans of Scotland*, Collins, Glasgow, 1971, p. 112.

[9] Sir Robert Gordon, *A Genealogical History of the Earldom of Sutherland with a Continuation to the Year 1651*, Edinburgh, 1813, p. 182.

[10] The current Post Office Telephone Directory may appear to illustrate a continuing togetherness of the Gunns. From Aberdeen northwards there are 171 subscribers of the name Gunn. Of these, 19 are in Aberdeen city, 15 in Inverness city, and 41 in various exchanges outside the counties of Sutherland and Caithness. But in these two very sparsely populated counties there are respectively 12 and 84 Gunn subscribers.

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were quite different from Gordon's friends and enemies. Their history is one of continuous feuds around their inaccessible homeland. They rarely fought at any distance from it. There is no evidence of their presence in the south of the county. Their crest was an uplifted sword, their motto, *Either Peace or War*.

The clan map shows the Rosses and Munros occupying lands along the northern borders of Ross-shire. Their histories are shadowy in early years. Mackinnon[11] reports that the first earls, none of whom was related to his predecessor, were sent by the Scottish kings to establish and consolidate the Royal authority in Ross. Bain[12] reports the first Munro of Foulis as dying in 1126. It is probable that both clans were living comfortably enough in the fertile parts of the county then, and, like some of the other clans, a bit undecided in their loyalties.

So far, guided by modern scholars, and by some not so modern, I have shown the locations of the progenitors of the principal clans in or near Sutherland about the twelfth century. I have also hinted, by quotation and otherwise, at what may be deemed the characteristics of two important clans, the Macleods and the Gunns. Those locations, and those characteristics could well prove to be determinants in the later history of Sutherlandshire.

THE CLANS FORMING UP IN THE PROVINCE OF MORAY

Historians agree that the roots of the clans Murray, Sutherland and Mackay lie in the Province of Moray, the Latin name for which is Moravia. I suggest that the tribes which coalesced to form the Murrays and the Sutherlands were to be found nearer the shore, while those which formed the Morgan or Mackay clan were hill-dwellers, especially towards the east, where they were on friendly terms with the clan Forbes or their progenitors, also men of the hills. One must here quote from the Rev. Angus Mackay[13] who was proficient in Gaelic.

> The name Morgan or Morcunn comes from the Gaelic word *mor*, the sea, and is said by the author of the *Gaelic Etymological Dictionary* to mean "sea-bright." The place name Moray, which appears in the older forms as Murev, Murav, comes from the same root, and means the "sea-side." Murav denotes the "sea-side land" or Moray. So did the name Morgan arise to denote Moraymen in general, or a certain section of that people.

[11] Donald Mackinnon, *The Clan Ross*, 1972, p. 5.

[12] Robert Bain, *op. cit.*, p. 244.

[13] Angus Mackay, *The Book of Mackay*, Norman Mcleod, Edinburgh, 1906 pp. 11-13.

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The Rev. Mackay went on to add that the name Morgan is peculiar to the counties of Moray and Buchan, that in the Advocates' Library in Edinburgh the name Morgan is never found in any Highland family, except that of Moray. The earliest evidence of its use is in the *Book of Deer*,[14] dated a few years after 1132, when the chief of the Clan Morgan made a grant of land to the abbey there. Further, he quoted that Sir Robert Gordon repeatedly applied the name Morgan to the Mackays in Sutherland in his history of 1651.[15] The transition from the name Morgan, through the name MacEth to that of Mackay, and the evidence for this, will best form an appendix to this essay.

It is difficult to disentangle the roots of the clans Sutherland and Murray. This is probably the reason for their non-appearance in Johnston's Clan Histories Series, and also why there is no Clan Sutherland Society, and only a Sutherlandshire Association. Both clans claim as a progenitor a man Freskin, of debateable origin, who, having rendered service to King David I (1124-1153) received (or his sons inherited) lands in Moray from the King. Thus he (or they) took over lands and people who were already grouping themselves into what was to become the clans Murray and Sutherland. The name Murray persists unchanged in the family of Atholl. That some Murray or Morayman became the ancestor of the family of Sutherland appears admitted, but both his name and dates remain in doubt. Duffus, on the coast of Moray, near Elgin, is shown on Moncreiffe's map as an early Sutherland possession.

Assuming that the Murrays and Sutherlands were in the coastal districts of Moray in the twelfth century, then both groups and their progenitors would possess oared and sailing craft for fishing and trade. Their vessesls would visit Ross and south-east Sutherland from time to time, as distances were short. Family units are likely to have been established along these coasts. This would be a matter of wise foresight as a place of retreat or refuge, as rebellions continued for so long in the turbulent Province. A study of population distribution of later date suggests that the Murrays may have sent families and friends especially to the parishes of Creich, Dornoch and Rogart, while the Sutherlands established their friends in the parishes of Golspie, Clyne and Loth. Both clans naturally stopped short of the Gunns, well dug in in Kildonan. It may be that some Mackays migrated to Creich.

The Book of Mackay[16] reports:—

> In Latin documents included in the Chronicles of the Picts and Scots in Fordun's *Annalia*, Malcolm MacEth or Mackay,

[14] Angus Mackay, *op. cit.*, p. 14. The Abbey of Deer is about nine miles west of Peterhead.

[15] Sir Robert Gordon, *op. cit.*, pp. 11, 58.

[16] Angus Mackay, *op. cit.*, pp. 6, 23.

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who claimed the Earldom of Moray, became First Earl of Ross about 1157. Malcolm was discontented, and renewed the struggle against the King. In the ensuing tumult, Malcolm MacEth was overcome, captured and blinded. Writing some 200 years after 1160, Fordun, or his continuator, describes these events in his *Annalia:* "At this time, the rebel nation of the Moraymen, whose former lord, the Earl Angus, had been killed by the Scots, would, for neither prayers nor bribes, neither treaties nor oaths, leave off their disloyal ways, or their ravages among their fellow countrymen. So, having gathered a large army, the King removed them all from the land of their birth, as of old Nebuchadnezzar, King of Babylon, had dealt with the Jews, and scattered them throughout the other districts of Scotland, both beyond the hills and this side thereof, so that even not one native of that land abode there, and he installed therein his own peaceful people. In consequence of this treatment many of the Moraymen, and among them the Clan Morgan, fled northward over the hills of Ross into Strathnaver where the Norsemen gave them shelter."

The Rev. Mackay[17] then asked himself the question: How did the Clan Morgan, of whom we get a glimpse in the Province of Moray about 1133, reappear afterwards in distant Strathnaver, and there continue to be known by exactly the same title? His answer was: "We believe the solution of the problem is to be found in the transportation of the Moraymen about 1160, in consequence of their continued rebellion, culminating in that of Malcolm MacEth, First Earl of Ross, their leading representative." He added that those who settled in Strathnaver would receive a welcome from Harold, the Norse Earl of Caithness, who had married Gormlath, "blue-eyes," the daughter of Malcolm MacEth.

So far, I have described (with pleasure and interest) what the historians tell of certain happenings in and around Sutherlandshire more than eight centuries ago. As an essayist and not a historian, I now feel free to speculate upon the mechanics or forces involved in the Great Clearance of Moray, so graphically described by Fordun[18] in ten simple lines.

When the army of Malcolm IV entered Moray in 1160, intent upon destruction, the shore dwellers of that Province, long forewarned of trouble ahead, cleared out speedily, and mainly by sea, to settlements already well established in south-east Sutherland. Murrays and Sutherlands were among those who sailed away. The Morgans, or Mackays, hillmen, were the largest group in the

[17] Angus Mackay, *op. cit.*, p. 15.

[18] John of Fordun died *c.* 1384. A secular priest, he composed his history in the latter half of the fourteenth century. Probably a chaplain in the Cathedral of Aberdeen, he wrote six books, one uncompleted, on the history of Scotland. Walter Bower, 1385-1449, Abbot of Inchcolm in the Firth of Forth, completed the work—the *Scotichronicon.*

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Province. They had no boats. They thought they had no need ever for boats and so there were only three routes open to them for flight. Some families went east into Aberdeenshire, losing their identity in clans who happened to be free from the assaults of the King's forces. Others fled south over the mountains, avoiding the invading columns, and settling in regions by-passed by their enemies.

By far the greatest number of Moraymen, hustled and harried by their enemies, many with homes wrecked and burned behind them, made for the district round Inverness. Transportation! The Romans never built roads in Moray! The natives thought there was no need for them! Theirs was subsistence type of living, more or less self-contained. The only effective transport would be by pony, for those fortunate enough to possess one. The "roads" would be only pony tracks. Some refugees detached themselves to venture down the Great Glen, perhaps establishing a Mackay nucleus in Argyll* or completely losing their identity in some of the clans already firmly established. But the great majority took the route by Beauly and Dingwall. They thought the only safe place from the King's wrath would be the empty spaces of Sutherland. It is impossible to say what welcome or unwelcome the escapers received in Ross and Cromarty from the early Frasers, Urquharts, Munros and Rosses en route. By the established crofters the stragglers were already being lumped together as Morganich or Morganish, no matter to what minor clan they might belong. They were looked upon somewhat as some folk look upon gypsies, and the collective name stuck, and the numbers using it increased. Their departure for any destination was hastened and encouraged. They were slow moving, ill-fed, ill-clad and mostly bare-footed. Some might have one or two beasts of sheep, and of household goods, very little. The little processions may have been going past the settled onlookers for months or years, both before and after 1160. Earlier, it had taken King David I (1121-1153), five years to appear to conquer the men of Moray.[19] At last, now, the greatest number of the rebels were on the move, and their chief, Malcolm MacEth, slain. They were landless! Morganich! On this land route to hopeful safety they were all Morganich!

When they came round, or over, the Struie Brae, they became acutely aware of the passive forces of nature on their left, the forbidding moors and mountains. Below, on their right, were the indifferent or possibly hostile Munros and Rosses in the little crofts around Tain. The hillside tracks inevitably compelled them down towards Ardgay and Bonar. Over the Dornoch Firth they saw the lands, so attractive, for which the Murrays and Sutherlands, coming

* I have shown in *The Mackays of the Rhinns* that the pedigrees of the northern Mackays and the southern are different.—EDITOR.

[19] Peter Hume Brown, *A Short History of Scotland*, Oliver and Boyd, Edinburgh, 1908, p. 67.

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by sea, had already staked a claim. The facts of physical geography forced them up the rough tracks by the River Shin towards the Loch. Could they settle there? There was not a hope. The two oldest and most warlike clans then in Sutherland, the Macleods in Assynt in the west, and the Gunns around Kilbreck, and in Kildonan on the east, were equally determined to keep the Morganich on the move, to force them to the very furthest north, to the scarcely inhabited lands along the shores of the Pentland Firth. Nowhere, on their way from Moray to well north of Loch Shin, was the broken column of stragglers given the chance to fan out. Macleod and Gunn patrols saw to that. Yet, they "made it," and in considerable numbers too, for the land they came to occupy was extensive and for centuries now has been named "Mackays' Country."

Banished thus, the Morganish under their MacEth chiefs, established their headquarters at Durness and Tongue. Their backs were to the sea. They were inward looking. When the chief, on a morning, climbed Coldbackie Hill (still called Mackay's Watch Tower), above Tongue, he could see the humble dwellings of his clansmen below and around. In the distance there were lofty mountains, and a half circle of his potential friends or enemies, the Sinclairs and Keiths in Caithness, the restless Gunns in Kildonan, towards the south the Sutherlands, his enemies for the next six centuries, Murrays further off, and towards the south-west the ever vigilant, tenacious Macleods among the Torridon mountains. Hillmen in Moray, the Mackays remained hillmen in Sutherland. They bred sheep and cattle. They also bred soldiers, by the thousand —infantrymen, foot-sloggers, a few generals, but no admirals.

So the answer to the question I asked myself is this: The King of Scotland, acting doubtless under Divine Command, forceably and finally banished the Clan Mackay, in its formative stages, under its MacEth leaders, from the Province of Moray, around 1160. He did not care where the clan went, provided it went away. The only place where the clan could go was to the sparcely populated county of Sutherland. On their way there they were hemmed in by the mountains of the west and the unfriendly clans to the south-east. Finally, wedged between the Macleods and the Gunns for many miles, and kept on the move, they found an abiding place in what is now called the Reay Forest, and the wilds above Strathnaver.

I have no knowledge of the final destination of those Moraymen who fled south in 1160. Modern authorities are at variance on that subject. Mr John Prebble had kindly sent me the names and places of origin of some 27 Mackays, serving with the Jacobites in the 1745-6 Rebellion, who were made prisoners of war by the Government forces. Of these, nine came from Moray, seven from Angus, five from Inverness, two from Sutherland, and four were indefinite. Could some of these be descendents of the Moray dispersion? "So much for idle musing! How it steals the time."

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APPENDIX

MORGANICH—MORGAN—MACETH—MACKAY

It is impossible to write about these names without turning to the scholarly work of the Rev. Angus Mackay.[20] He devoted several pages to this subject, of which the following is a brief summary: In Fordun's *Annalia*, etc. Malcolm MacEth or Mackay, who claimed the Earldom of Moray, and became the first Earl of Ross about 1157, is variously denominated MacEth, MacHeth, MacEd, MacHead, etc. He then quotes another Gaelic scholar, Dr MacBain: "The name Heth is the most ill-used syllable I know of; It appears as Head, Eth, Ed. It is the very favourite name of Aed, or Aodh, later translated as Hugh. MacEth is an old form of Mackay." The Strathnaver Mackays appear in public records as Makky, Macky, McKye, etc., but the commonest form was McKy. In 1630, Sir Robert Gordon was spelling the name as Iye, and in some cases simply as Y, the Rev. Angus Mackay adds many other varieties. This variability must often occur in communities where few can read or write.

My interpretation of all I have read on this subject is this: In the eleventh and twelfth centuries there was a tribe of steadily increasing numbers in Moray, called Morgan. Its numbers grew by accretions from the many smaller clans in the Province. It had a succession of unidentified leaders, until one, named Malcolm MacEth appeared. He was probably an Earl of Ross, and led the Morgans in rebellion. As the Morgans started on their trek to Sutherland, they, and all with them, became the Morganich or Moray men. Their leader into Sutherland was still a member of the House of MacEth, whose name came to be spelt in a great number of ways. After some centuries, the name stabilised to Mackay, while coincidentally the name Morgan disappeared from use in the region, and from Highland history.[21]

In this essay I have kept strictly to my purpose of writing about the common people, the clansmen, and not about the chiefs. However, I conclude by giving for the reader's interest the table of the early descent which appears to have been acceptable to the Rev. Angus Mackay.[22]

I. Aed, Earl of Moray, married a daughter of Lulach, *c.* 1085.

II. Angus, Earl of Moray, killed 1130 at Strathcathro, in Forfar. Angus had 4000 Moraymen with him, but was defeated by David I with English aid.

[20] Angus Mackay, *op. cit.*, pp. 4-6.

[21] The 1975 Post Office Telephone Directory for the Highlands and Islands includes Orkney, Shetland, the Hebrides, Caithness, Sutherland, Inverness, and Argyll south to Kintyre. The approximate numbers of clan subscribers include: Morgan, 20; Polson, 30; Bain, 115; Mackay, 700. Both Polson and Bain are septs of the Clan Mackay.

[22] Angus Mackay, *op. cit.*, p. 27.

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III. Malcolm MacEth, Earl of Ross, married a sister of Somerled, Lord of The Isles. Lost Ross *c.* 1160.

IV. Donald MacEth. Captured in Galloway, 1156.

V. Kenneth MacEth, a son or nephew of Donald. Killed 1215.

VI. Iye Mackay, 1330-1370. First Mackay chief.
A later chief was Angus Dhu, 1380-1428, a leader of 4000 men.

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The Impact of Famine on I.Q.

By NATHANIEL WEYL

In its September 1972 issue, *Science* published a landmark study of the influence of maternal starvation on the subsequent intelligence of children.[1] This extremely painstaking inquiry came to the unexpected conclusion that prenatal exposure to famine caused no ascertainable subsequent impairment of the mental performance.

The investigation was based on the Dutch military induction examinations of the classes of recruits who were carried *in utero* during the *hongerwinter* of 1944-1945.

The historical background is briefly as follows: In September 1944, British paratroopers landed at Arnhem to force a bridgehead across the Rhine. In support of this attempt and on orders from the Netherlands Government in Exile, railroad workers in western Holland downed tools. The paratroop effort failed and in reprisal the Nazis placed an embargo on all land transport to western Holland. A severe winter froze the canals and stopped barge traffic. Soon no food reached the large cities. The Dutch *hongerwinter* became acute in November 1944 and continued until May 1945 when Allied troops liberated Holland. During December 1944-February 1945, per capita food intake averaged 740 calories against a Food and Agriculture Organization estimated requirement of 2420 calories. During the next quarter, average food consumption dropped to 670 calories. The famine was thus unusually severe and starvation deaths were common. Proteins, fats and carbohydrates were about equally affected.

The team of four Columbia University scientists decided to investigate the after effects of this calamity because it provided a unique opportunity to study the impact of hunger on intelligence. First, the *hongerwinter* was sharply defined in both time and space. Second, it occurred in a country where statistics are comprehensive and reliable. Third, the extent of nutritional deprivation was known.

Zena Stein and her associates analyzed the intelligence tests given all Dutch military recruits who had been conceived or born during the famine months. These 19-year-old recruits were divided into three-month age-cohorts so that any observed differences in I.Q. could be correlated with the period of pregnancy during which mothers had been exposed to famine.

[1] Zena Stein, Mervyn Susser, Gerhart Saenger and Francis Marolla, "Nutrition and Mental Performance," *Science*, Vol. 178, No. 4062, September 1972, pp. 708-713.

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The Nazis inflicted the food embargo on western Holland only. Hence, recruits from such hunger cities as Rotterdam and the Hague could be compared with a control group from such unaffected towns as Maastricht and Breda. Fortunately, the Dutch draft boards used Raven Progressive Matrices, probably as culture-free a test of intelligence as has yet been devised, to determine the I.Q.

The results of this admirable controlled investigation were unexpected. Babies conceived or born during the famine tested 19 years later were as high in I.Q. as those whose mothers had had normal nutrition. Prenatal exposure to famine conditions over an eight-month period had had no permanent discernible effect on mental performance.

This finding is in apparent contradiction to widespread recent claims that severe protein deficiency during the gestation period critical to brain development causes permanent mental impairment of the infants affected. Since the brain grows mainly by absorbing and synthesizing proteins and since the bulk of this growth occurs during gestation and the first year of nonfetal life, the *prima facie* case for irreversible damage to the minds of victims of the *hongerwinter* seemed formidable.[2] A variety of studies have shown that infants who suffer from drastic fetal or neonatal protein deprivation have substantially lower I.Q. frequency distributions and smaller brains than control groups.[3]

Zena Stein and associates observe that the apparent contradiction between their findings and those of earlier investigators may be due to the fact that the Dutch famine lasted only eight months. By contrast, the South African, Guatemalan and Chilean babies studied had been born to mothers who presumably had been exposed to drastic malnutrition and undernutrition since birth.

Moreover, the studies of fetal and neonatal protein deprivation which I have seen suffer from a basic defect. The malnourished parents may be paired in terms of socioeconomic status with the control-group parents, but the two groups are not paired as to I.Q. Hence, the possibility always exists that the

[2] Some 70 per cent of brain growth occurs before the infant's second birthday (Arthur E. Jensen, "How Much Can We Boost I.Q. and Scholastic Achievement?" *Harvard Educational Review*, Vol. 39, No. 1, Winter 1969, p. 73).

[3] M. B. Stoch and P. M. Smythe, "Does Undernutrition During Infancy Inhibit Brain Growth?" *Archives of Disadvantaged Childhood*, No. 38, 1963, pp. 546-552. The authors found a 20-point spread between extremely malnourished and normally nourished South African colored neonates. They added that the D.Q. and I.Q. gap between the two groups remained constant eight years after birth. Studies in Guatemala, Chile and elsewhere have yielded similar findings.

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drastically malnourished parents are of substantially lower I.Q. than the control group and are unable to make a living for this reason. If this is the case, an unknown part of the difference in I.Q. and brain size between the two groups of infants could be hereditary.

Various social scientists, publicists and politicians have seized upon the posited relationship between extreme maternal protein deficiency and permanent brain impairment in children to assert that malnutrition in general causes irreversible I.Q. loss. This supposed fact has then been advanced as an "explanation" of the observed difference of about one standard deviation between American Whites and American Blacks. This crude equation between malnutrition and brain damage was never warranted by the evidence. The landmark study of the Netherlands *honger-winter* should serve to refute it decisively.

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The Anthropological Find from the Szabadszallas-Boczka Estate in Hungary

By PAL LIPTAK*

A skeleton was recently uncovered at a depth of 180 cm. in a stratified layer in the Boczka estate on the outskirts of Szabadszállás, Hungary. The find was a result of the excavations conducted by Dr Elvira H. Tóth. The skeletal material probably dates from the fifth century A.D. From the archaeological viewpoint, there is no analogue in Hungary to this particular grave. The archaeological aspects of the excavation—including the find of an early Byzantine glass-cup—are discussed by Dr Tóth in her report.[1]

The more important metric data relating to the cranium are presented in Table 1 and Table 2. The morphological traits are described in Table 3. Finally, the most important measurements of the long bones are listed in Table 4. From these measurements the stature was estimated by the method of Wolanski's nomogram.

The absolute measurements of the cranium are not large. According to the cranial index, the skull is mesocranial—although on the border of dolichocranial (long-headed). The skeleton is incomplete. The skeletal bones are in a medium state of preservation.

On the basis of the well preserved pelvis, the characteristics of the skull and of the other bones, the find can clearly be established as male. A degree of uncertainty arises only due to the circumstances that the cranial contour from the top view is pentagonoid and the mastoid apophysis (processus mastoideus) is small. In Figure 1, the skull is shown in four views.

The taxonomic analysis indicates that we are concerned here with a type of relatively greater—really above average—stature. The find can also be denoted as Atlanto-Mediterranean in racial type.[2] The Mediterranean aspect can be characterized by the above-mentioned two anthropological traits. In consideration of the rather broad face, we can also denote a lesser degree of Cro-Magnoid influence.

* Translated from the German by Donald A. Swan.

[1] Elvira H. Tóth, "Kora-bizanci üvegpohar egy szabadszállási máganyos sírból." ("Early Byzantine Glass-Cup in a Solitary Grave at Szabadszállás Kecskemét, 1969"). *Act. Arch. Ach.*, Vol. 23, 1971, pp. 115-138.

[2] Pal Lipták, "On the Taxonomic Method in Palaeo-Anthropology," *Acta Biologica Univ. Szegediensis*, Vol. 11, 1965, pp. 176-183; Pal Lipták, *Embertan és emberzármazástan. (The Anthropology and Origin of Man)*, Egyetemi tankönyv, Budapest, Hungary, 1969.

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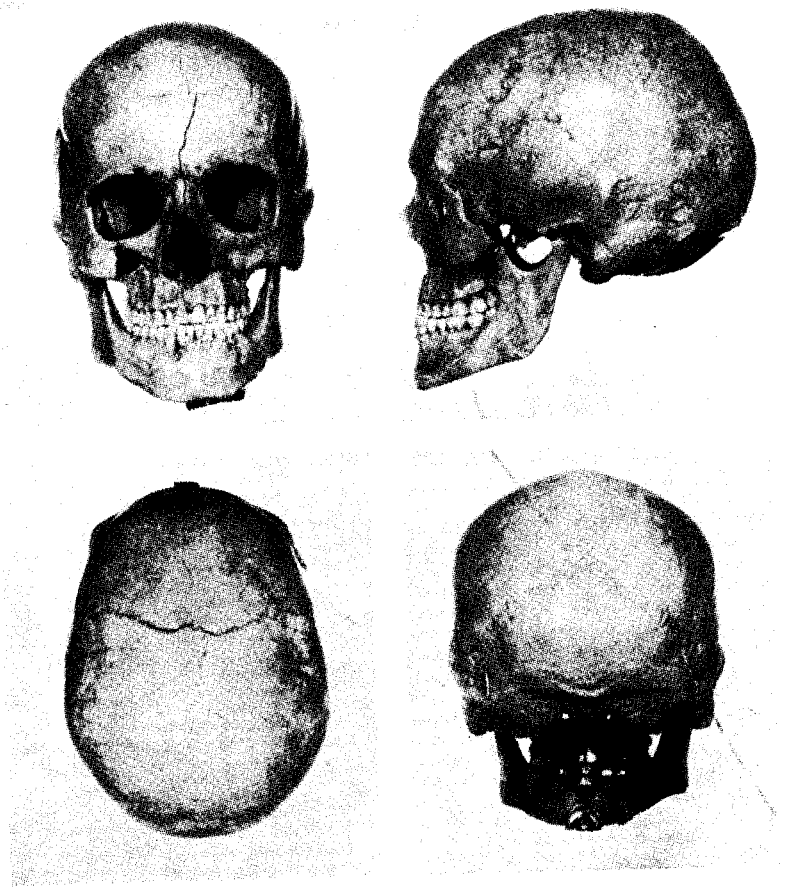

Figure 1: Four views of the Skull from Szabadszállás-Boczka, Hungary. Front, side, top and rear.

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TABLE 1

Anthropological measurements of the skull from Szabadszállás-Boczka, Hungary

Martin number	*Anthropological trait*	*Measurement (in m.m. or degrees)*
1	Glabello-occipital length	184 m.m.
1c	Metopion-occipital length	179 m.m.
5	Basion-nasion length	101 m.m.
8	Maximum breadth of cranium	139 m.m.
9	Minimum frontal breadth	94 m.m.
17	Basion-bregma height	132 m.m.
20	Porion-bregma height	114 m.m.
32/la	Frontal angle	52°
38	Calculated cranial capacity	1350 c.c.
40	Facial length	92 m.m.
45	Bizygomatic breadth	125 m.m.
46	Maxillar breadth	94 m.m.
47	Total facial height	111 m.m.
48	Upper facial height	67 m.m.
51	Orbital breadth	39 m.m.
52	Orbital height	33 m.m.
54	Nasal breadth	24 m.m.
55	Nasal height	54 m.m.
62	Palatal length	45 m.m.
63	Palatal breadth	40 m.m.
65	Bicondylar diameter	121 m.m.
66	Bigonial diameter	101 m.m.
69	Chin height	30 m.m.
70	Ramus height	70 m.m.
71	Ramus breadth	30 m.m.
72	Total facial angle	88°

TABLE 2

Anthropological indices of the skull from Szabadszállás-Boczka, Hungary

Martin number	*Anthropological index*	*Index Value*
8: 1	Cranial index	75.54
17: 1	Length-height index	71.74
17: 8	Breadth-height index	94.96
9: 8	Transversal fronto-parietal index	67.63
47: 45	Facial index	88.80
48: 45	Upper facial index	53.60
52: 51	Orbital index	84.62
54: 55	Nasal index	44.44
63: 62	Palatal index	88.89

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TABLE 3

Morphological characteristics of the skull from Szabadszállás-Boczka, Hungary

Morphological trait	*Morphological trait description*
1. State of preservation of the cranium.	Cranium of medium degree of preservation.
2. Age.	Adult.
3. Skull shape — Norma verticalis.	Pentagonoid.
4. General characteristic traits of the cranium.	Mesocranial. Orthocranial. Metriocranial. Euencephalic.
5. Brow.	Metriometopic. Sloping.
6. Glabella.	Moderate—Stage: 3-4.
7. Skull shape — Norma occipitales.	Domestic form.
8. Prot. occ. ext.	Stage: 2.
9. Processus mastoideus.	Small.
10. Face.	Mesoprosopic
11. Upper face.	(Mesen).
12. Fossa canina.	Stage: 3.
13. Orbita.	Mesokonch. Moderately angular.
14. Nose.	Leptorrhine, straight, average.
15. Nasal spine.	Projecting.
16. Facial profile.	Orthognathous.
17. Prognathia alveolar.	Stage: 2.
18. Observation.	Wormian bone in the lambda region.
19. Stature.	168 c.m.—above average.
20. Taxonomic determination.	Atlanto-Mediterranean racial type.

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TABLE 4

Measurements of the skeletal material from Szabadszállás-Boczka, Hungary

Skeletal trait	*Measurement (in m.m.)*
Greatest length of the femur—right	460 m.m.
—left	463 m.m.
Femur in natural position—right	458 m.m.
—left	460 m.m.
Tibia—right	—
—left	380 m.m.
Humerus—right	336 m.m.
—left	336 m.m.
Radius—right	—
—left	257 m.m.
Ulna—right	276 m.m.
—left	—
Stature	168 c.m.

IMPORTANT REPRINT

Practical Considerations which are Fundamental in Bantu Affairs in Rhodesia and for an Understanding of Negroid-Caucasoid Problems Generally

by R. GAYRE OF GAYRE

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On A Priori Genetic Information

(THE EVOLUTIONARY EQUIVALENT OF KANT'S A PRIORI)

By F. J. IRSIGLER

In his contribution to the Fourth International Kant Congress A. Lichtigfeld[1] has discussed the problem of reading the reality, that is, the world of tangible phenomena as "a cipherscript of Transcendence."

According to Lichtigfeld, Jaspers, in going beyond Kant, comes to the conclusion that this ambiguous cipher language is "open to infinitely varied interpretations."

I propose to explore here the problem whether an organic system of the character of the genetic code is conceivable such as to be able, in terms of evolutionary genetics, of acquiring, storing and transmitting a programme of fundamental cognition and of behaviour patterns corresponding to this programme; and, in addition, enabling the organism to respond to environmental demands and opportunities in a range of meaningful ways such as to make it an "autonomous" being.

Recent research in various fields from brain physiology to chromosomal analysis indicates that the above question, associated as it is, with the Kantian concept of "*a priori* knowledge" can well be answered in the affirmative.

Our discussion will be conducted along three lines; they are different but interrelated and converge on a "final common path" which leads to the genetic system and the way it handles information coming in from different sources.

THE STRUCTURE OF SENSORY PERCEPTION

The Doctrine of Dialectic Materialism that the "real external world" is literally present in the consciousness (if it was ever taken seriously) is a thing of the past. The correspondence principle with its idea of a blank slate organism, upheld by developmental psychology and "classic" behavioural genetics, was a legitimate child of positivism and, consequently shelved when the latter's shortcomings and final decline became apparent.

The work, mainly due to the schools of Stephen W. Kuffler and Ragnar Granit, has conclusively shown that the function of the sensory input is chiefly that of a signal initiating, along its path of propagation from the receptor to particular cells in the brain

[1] A. Lichtigfeld, "Jaspers' Kantian Step from Objective to Non-Objective Thinking," Akten des 4 Internationalen Kant-Kongress, Mainz, 6th to 10th April 1974, Walter de Gruyter, Berlin, 1974, Teil II. 2, p. 762ff.

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cortex, a complicated process of selective screening, integration and interpretation. This process is structurally determined by the differential organisation of the peripheral sensory organs and the central nervous system. Their development is highly specific from the start and their architecture is altogether under genetic control (G. G. Simpson);[2] nor is it visibly modified by the training effect of its own operation. Reference is made here to the papers by D. H. Hubel and T. N. Wiesel, as well as to the publication "What the Frog's Eye Tells the Frog's Brain" by J. Y. Lettvin and associates (1959). These investigations have revealed that in the visual field (where most of the work has been done) the organism is capable, by using an ingenious system of successive neuronal relays or "grids," to decompose the "image" into its fundamental geometrical features, as well as to recompose and classify the objects according to their shape, spatial orientation and relationship. Such a performance requires various degrees of abstractedness and categorial classification. Electrophysiological investigation proves that a motionless black speck is well registered by the frog's retina; however, since it does not prove the presence of a fly, it is extinguished: the frog will catch its prey when moving only, not when at rest.

Obviously, such phenomena may be interpreted in terms of so-called innate behaviour patterns, forming part of the species' genetic patrimony. Their rigidity has been emphasized by modern behaviourists. "In an overwhelming number of cases the organism responds to a biologically significant outside stimulus without having any previous experience, and without resorting to trial and error; and this response is immediate and follows a specific pattern which is meaningful in the sense of preserving the species."[3]

Lack of previous experience here includes experience on a phylogenetic scale, that is, acquired by previous generations in the way of adaptive processes of evolution or, as J. Monod puts it, "wrung from chance."

The electrophysiological investigations by Hubel and Wiesel mentioned above have revealed that in the visual cortex of higher animals neurons are present capable of analysing input signals along abstract patterns not encountered, in all probability, before, either by the animal or its ancestors. Such patterns include, for instance, series of straight lines sloping down from left to right or in the opposite direction. Neuronal impulse activity evoked by such configurations can hardly be considered as an effect of previous exposure, that is, as a product of any preceding, including ancestral, environmental instruction.

[2] K. Lorenz, *Uber tierisches und menschliches Verhalten—Gesammelte* Abhandlungen, München, 1965, Band II, p. 250.

[3] G. G. Simpson, *Behaviour and Evolution* (edited by Anne Roe and G. G. Simpson), Yale University Press, New Haven, 1958.

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It is not yet clear, in view of the enormous number of neurons available for transmitting and interpreting sensory inputs, whether even single cells may lie in readiness as specific perceptual organizers for analysing environmental stimuli which may turn up *de novo* during the lifetime of an individual organism. Though this assumption may seem somewhat strange, no other plausible explanation, in the light of physiological evidence, has been put forward so far (Gunther S. Stent).

What we have here, in terms of evolutionary genetics, is Kant's idea of knowledge without learning, or, in modern terminology, information not "fed into" the organic system by the mechanism of phyletic adaption. Modern "structuralism," as it is called, opposes the idea that, what was not of immediate utility to the species, was disposed of and became lost. Structuralism is being developed in the fields of experimental research as far apart as neurophysiology, psychology, linguistics and anthropology.

To put the view, offered here, in a nut shell: The so-called objective world is an autonomous construction[4] of the organism by means of which the living being orients[5] itself, using the most tricky and ingenious ways, in the maze of ever-changing environmental conditions, in other words, a means of behavioural adaptation. Its ultimate meaning resides in the species', not individual, survival.

THE GENETICS OF ANTIBODIES

Information locked up in the molecular structure of the hereditary apparatus and lying in readiness to meet contingencies which may turn up with changes in environment and compromise the conditions of survival, is most clearly revealed in the formation of antibodies.

The key problem here is the origin of the highly specific part of the molecular structure on the surface of specialized cells and their cell lines' (or clones') product, the antibody molecules themselves.

Two alternative hypotheses have been proposed: (1) The antigen itself yields the information to be used, as a sort of template, by the organism for the production of the required antibody structure; (2) Each cell (lymphocyte) belonging to the immune system produces, as long as it is at rest, its own particular anti-body as the "receptors" on its surface. An antigen invading the body will stimulate multiplication of just the progenitor cell of the matching antibody. This results in a clone of plasma cells all of which are committed to the production of one specific antibody molecule.

Here, as in the "genetic play" in general, the foreign stimulus has the function of an arouser (rather than composer) and selector

[4] See A. J. Ayer *Language, Truth and Logic*, London, 1964.

[5] "Orientierungschilfe" in E. G. Kolbenheyer's *Bauhütte*, 1925-1968, and *Metaphysica Viva*, 1960, L. C. Wittich Verlag, Darmstadt.

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that picks out, among an immense diversity, the molecule matching its own "epitope" (Jerne), that is, the small surface patch defining its antigenic character.

It is obvious that here again the problem arises: Whence the diversity? Is it imaginable that any outside signal that the organism may encounter during lifetime and recognizes as significant will meet its exact counterpart inside the body? Regarding the immense number of such patterns this appears somewhat unrealistic. However, such doubts can be met by considering approximate figures of cells producing immunoglobulins and their products in the living body, as well as the rate of their renewal and decay.

The immune system (of man) is made up of about 10^{12} lymphocytes (about 100 times as many as neurons) and about 10^{20} antibody molecules secreted by them and ready to meet a corresponding pattern. According to N. K. Jerne[6], of the Institute for Immunology in Basel, each lymphocyte produces and secretes 2000 identical antibody molecules per second. Though subject to unceasing decay and suppression, the more than 10^{10} new lymphocytes emerging from the thymus every day maintain, together with those from other sources, a concentration of the order of 10^{17} antibody molecules per millilitre blood. It is nowadays generally agreed that genes coding for the recognizable region of antibody molecules must have arisen during individual growth by "mutations" as well as rearrangements of the genetic material propagated through Weismann's Keimbahn, that is, egg and spermatozoa and their precursor cells. This is the essence of the somatic theory.

The Japanese geneticist S. Ohno[7] has recently reported on a special ability of the gene loci specifying the subunits of immunoglobulin molecules to provide immensely variable amino acid sequences to their polypeptide chains. Antibody specificity is brought about by substitutions in a unique region of the chains composing the molecules. Assuming 40 variable sites within this region with each site choosing one out of three amino acids, the region will generate 3^{40} or about 10^{20} different variable sequences—more than enough to account for the different antibodies ever realized in the living world whose age, after all, cannot exceed that of the universe, a mere 10^{17} seconds.

Thus, the essential point here is that the living body shows itself capable of giving rise to an enormous diversity of functional units of the highest specificity without any previous experience or exposure to the outside stimulus which that diversity is committed and ready to counteract successfully. Here, then, the organism reveals an anticipatory function directed towards future needs.

[6] N. K. Jerne, "The Immune System," *Scientific American*, Vol. 229, July 1973, p. 52.

[7] S. Ohno, *Evolution by Gene Duplication*, Berlin, 1970.

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GENETIC REDUNDANCY

The fundamental tenet of the modern synthetic theory of evolution maintains that "adaptation is not reciprocal between organism and environment; the organism is adapted to the environment and not *vice versa*."[8] This theory combines so-called spontaneous mutations, considered as chance events or "accidents" with natural selection, the latter being the driving force of the causal chain which links the environment with the living beings in an irreciprocal relationship of rigid necessity. The last two or three decades have seen a sort of mellowing of these orthodox views. First, the concept of "directional mutations" has replaced that of random events as the exclusive suppliers of building blocks for selection to work with. Second, endogenetic or intrinsic factors were introduced modifying ontogeny at certain points and at different rates during epigenetic development; from this point of view, phylogeny is due to modified ontogeny. However, it is still held by the father of synthetic theory that "evolution on the basis of existing variability is a self-limiting process that cannot proceed beyond about the specific level so that "loss of hereditary variation is balanced by the appearance of new mutations" (Simpson).

From these premises two important consequences flow: (1) Natural selection can only produce results which are of immediate biological utility to the species (J. S. Huxley, 1954);[9] (2) Species formation is, to a large extent, by accident, a "biological luxury, without bearing upon the major and continuing trends of evolutionary process" (J. Huxley, 1942).[10]

We shall discuss these tenets in the light of recent research in what has been called chromosomal or karyotype evolution or evolution of genetic systems.[11] We may start from the changed concept of mutation. Originally, under the influence of De Vries's pioneering discoveries (which in their turn, were in the wake of Planck's theory), mutation was identified with the quantum event in physics. It was not long before it became apparent that recombinations of the hereditary material due to bisexual reproduction in all higher plants and animals was actually the main source of hereditary change providing selection with a vast range of types to work out successively improved gene-combinations.

Regrettably, these recombinations have become included in the broad term "mutation." The latter, taken in its proper sense, cannot be stripped of its connotation of uncontrollability and unpredictability. In addition, such extension of the mutation concept

[8] G. G. Simpson, *op. cit.*

[9] Quoted in C. D. Darlington, *The Evolution of Genetic Systems,* Cambridge, 1958, p. 239.

[10] See E. Mayr, *Animal Species and Evolution*, Harvard University Press, Massachusetts, 1966, p. 621.

[11] C. D. Darlington, *op. cit.*

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is legitimate only under the tacit assumption of unrestricted, random interbreeding and uniform environment neither of which are realized in living populations. Mating and gene flow, that is, exchange of genetic factors between adjacent conspecific populations owing to dispersal of gametes or zygotes[12] is never random. It is for these reasons that the French molecular biologist J. Monod[13] sets recombinations associated through sexual propagation apart and calls them "undetectable mutations."

It is now apparent, chiefly due to the work by E. Mayr,[14] that crossing of individual members of two unlike natural populations, that is, hybridization, as well as incorporation of genes from one species into the gene pool of another species are but minor contributors to evolutionary change. The same applies to the De Vriesian "point" mutations with gross phenotypic effects. The exaggerated claims made previously on behalf of these have been convincingly rejected by E. Mayr. It follows that we have to fall back on the intrinsic factors and "directional mutations" mentioned earlier. It was C. D. Darlington who drew a clear distinction between proper mutations of the De Vriesian type (in *Oenothera Lamarckiana*) and those genetic events exemplified by inbreeding Drosophila and maize both having ordinary genetic systems. It is in these genetic re-arrangements where what Darlington calls "evolutionary initiative" resides, meaning the origin of species as the units of evolution on a universal scale.

The force of the argument for the evolution of genetic systems as revealed by the extensive work on chromosomal analysis, does not rest exclusively on the frequency of all kinds of exchange of chromosomal material by translocations, inversions and the like, it resides, equally well, on the observational evidence of genetic redundancy, including preservation and transmission of genetic determinants that have been "silenced," that is, made genetically empty or neutral in relation to either the environment or the emerging generation. It is redundancy that helps to attain permanent heterozygous advantage by incorporation of two alleles (isozyme genes) into the genome as two separate loci thus precluding homozygous lethality (Ohno).

Genetic redundancy has as its normal counterpart the inactivation of the X chromosome and the so-called dosage compensation, that is, the effect produced by modifying genes to compensate for the difference in dosage between sex-linked genes.[15]

[12] E. Mayr, *op. cit.*

[13] J. Monod, *Chance and Necessity*, London, 1972.

[14] E. Mayr, *op. cit.*

[15] Inactivation of the chromosonal material can be visualised under the microscope as a process called heterochromatinization involving localised condensation, a sort of concertina effect that results in useless or intranscribable DNA sequences and thus precludes phenotypic expression (Ohno).

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The essential rôle of karyotype evolution and associated phenomena for the origin of species and evolution in general becomes clear when one considers the characteristic features of the processes involved. They are: (1) The sequence of events is controlled by conditions of chemical interactions at the molecular level. This amounts to lack of previous exposure to environmental instruction, analogous to antibody formation as discussed in the preceding section. Any imperfection or perturbation in the existing array is bound to induce a trail of fluctuations involving the genome as a whole, and not necessarily expressed in the phenotype such as to be seized upon by natural selection. This makes evolution and speciation at the molecular level a sequence of instabilities. The rise of neutral or inert sections is an essential part in the process for, as Ohno has pointed out, if selection is required for an advantageous mutant allele at every gene locus within the genome, evolution becomes a mathematical improbability. Indeed, the greater part of chromosomal polymorphism remains cryptic and therefore is likely to be overlooked (E. Mayr). This is exemplified by the so-called sibling species or "Geschwisterarten," that is, populations that are morphologically similar or identical but genetically isolated. Why the "mutability" is unequally distributed among the various gene loci is an open question. (2) It is inbreeding within small, ecologically isolated populations, as well as regular gene flow from adjoining conspecific groups, and not hybridization between unlike populations[16] that constitute the essential mechanism which furnishes living communities with a virtually unlimited host of alternative gene loci. The amount of this supply can be guessed from the information capacity locked up in the base sequences of nucleic acids. With n gene loci, each represented by b different alleles, b^n different allelomorphs are possible. Estimates based on the polymeric structure of nucleic acids in higher organisms suggest several hundred thousand loci capable of partaking in such molecular rearrangements (Mayr). This fact becomes even more impressive in the light of the isomorphism established between the number of discrete alleles at a single gene locus competing for expression with the number of different species competing for survival in the same niche or adaptive zone.[17] As Darwin clearly realized, the origin of species is the central problem in phylogeny. The studies on chromosome analysis, still in progress, undertaken by C. Wallace and co-workers[18] in the Kruger National Park Transvaal, clearly indicate that each gene

[16] Hybridization (in the above sense) is nearly always disharmonious and deleterious (E. Mayr, *op. cit.*).

[17] Garrett Hardin, "The Competitive Exclusion Principle," *Science*, Vol. 131, 1960, p. 1292.

[18] C. Wallace and N. Fairall, "Chromosomes Analysis in the Kruger National Park: Preliminary Results in the Bovidae," *South African Journal of Medical Science*, 1968, Vol. 33, p. 119.

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pool responds differently not only in rate of change and eventual outcome but also with respect to the modes of rearrangements within the genome. Experimentation with molecular polymorphism (also called "internal selection") puts each breeding group into the position of meeting existing hardships out of a multitude of different ways such as to benefit generations to come without doing harm to the present—a situation that may well be interpreted in terms of initiative and foresight.[19]

CONCLUSION

The present essay is not concerned with the transcendental forms of experience, that is, with the problem how experience is at all possible. It deals, instead, with the empirical fact how it comes about that, what is called the real or objective world is interpreted, by living beings, in so many different ways. Since it is the genetic code that co-ordinates physico-chemical requirements with those of biological significance our discussion had to concentrate, eventually, on the dynamic state of this code. It has been said that the genetic message can be read only by its own product;[20] in its turn, it is modified during realization of the product. This suggests a kind of circular arrangement based on the two essential features of the code: its extreme conservativism (or invariance), and its redundancy. The first is guaranteed by the replicating process and stabilized by natural selection. Redundancy, on the other hand, comes into play through mating and breeding. It is therefore inevitable and regular, but non-adaptive, adaptive understood as "of immediate utility." Nor is redundancy synonymous with a series of "occasional lucky mutants." It is through redundancy and genetic polymorphism including neutral and "switched-off" segments that the organisms can be aroused to respond with an almost unlimited number of modes, or, in Lichtigfeld's phraseology (from which we started), "open to infinitely varied interpretations." And these modes include those which have not been fed into the organic system by the slow process of trial and error, and elimination of the "unfit."

[19] C. D. Darlington, *op. cit.*, p. 240.

[20] F. Jacob, *La logique du vivant. Une histoire de l'hérédité*, Editionas Gallimard, Paris, 1970.

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Personality and Handwriting

By HENRY H. REITER

SUMMARY

Personality factors were studied by use of the California Personality Inventory and three measures of written expression: choice of printing or cursive writing, size of middle zone letters (a, c, e, m, n, o, r, s, u, v, w, x) and degree of slant. Among 46 randomly selected male and female college students, printers scored significantly higher in Do (dominance) and Ai (achievement via independence) than did those who used cursive writing. Those whose middle zone letters were larger than 1/8″ also scored significantly higher in Do (dominance), Cs (capacity for status), Sy (sociability), Sp (social presence), and Py (psychological-mindedness). Those subjects whose writing was upright rather than slanted forward scored significantly higher in Re (responsibility) and Ie (intellectual efficiency).

The present investigation concerned the relationship between personality of variables on the California Personality Inventory with three variables of written expression: choice of printing cursive writing, size of middle zone letters (a, c, e, m, n, o, r, s, u, v, w, x) and slant of handwriting.

A survey of the literature reinforces Allport's observation that "In general it does seem that variations in personality are accompanied by variations in script, although our knowledge of this phenomenon is incomplete."[1]

METHOD

Ss were 46 males and females enrolled in an introductory course of Speech Fundamentals. Handwriting samples were obtained by asking *Ss* to answer five simple questions on a 5″ by 8″ unlined index card. One week later the CPI was administered. Statistical t-tests were run on the 18 categories of the CPI for each of the three variables: choice of printing or writing, size of middle zone letters, and degree of slant.

RESULTS

Table 1 presents values of t (N=46) for the CPI categories contrasting those who printed with those who used script. It may be noted that Do was significantly different at the .05 level of confidence and Ai was significant at the .01 level.

Table 1 notes t-values of those *Ss* whose middle zone letters were larger than 1/8″, those whose middle zone letters were smaller than 1/8″ and the 18 variables of the CPI. Significant differences were found at the .05 level for Cs, Sy, and Sp, and at the .01 level for Do and Py.

[1] Gordon Willard Allport, *Studies in Expressive Movement.* (New York: The MacMillan Company, 1933), p. 188.

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TABLE 1

t — Values for CPI Factors and Form of Handwriting

	Do	Cs	Sy	Sp	Sa	Wb	Re	So	Sc	To	Gi	Cm	Ac	Ai	Ie	Py	Fx	Fe
Choice of printing or writing (N=46)	2.01*	0.74	1.08	1.50	1.07	1.65	0.91	0.63	1.41	1.84	0.76	0.42	1.80	2.72†	1.89	1.91	1.14	0.10
Middle zone letters $<\frac{1}{8}''$ $>\frac{1}{8}''$ (N=46)	3.12+	2.02*	2.29*	2.43*	1.81	1.33	1.50	1.15	1.21	1.36	2.07	2.10	1.52	1.26	1.53	3.19+	0.65	0.57
Slant of writing: Upright forward (N=33)	1.11	0.84	1.00	0.76	1.04	0.28	2.07*	1.78	0.36	1.53	0.26	1.05	1.19	0.76	1.98*	0.08	0.29	1.33

*p <0.05 †p <0.01

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Table 1 shows t-values (N=33) for those whose writing was upright, those whose writing slanted to the right, and the 18 CPI variables. Significant differences at the .05 level were found for Re and Ie.

These findings suggest that printers tend to exhibit stronger dominance and have a higher achievement via independence than those who use script. A review of the literature reveals no mention of this factor of printing versus writing. There seems to be a growing tendency on the part of students to print rather than to use cursive writing possibly due to less emphasis on the teaching of script plus the growing number of forms to be filled out with the directive "please print."

The findings further suggest that a positive relationship exists between the size of middle zone letters and dominance in personality and a positive relationship between size of middle zone letters and psychological mindedness, as measured by the CPI. The findings further reveal that those whose middle zone letters are larger than 1/8" tend to score higher on the Capacity for Status, Sociability, and Social presence. Rosen (1965) reported large letter size only in connection with generosity.

The findings indicate a higher degree of responsibility and intellectual efficiency among those subjects whose hand-writing is upright than among those whose writing slants to the right. Sara (1968), Rosen (1965), Anthony (1967), and Storey (1922) related degree of forward slant with emotionality, and reported that upright writing indicated an even balance between emotions and intellect.

DISCUSSION

The present findings suggest some credibility in graphologists' claims that handwriting is influenced by personality. Most graphologists agree that the handwriting profile must be viewed as a whole: that individual analysis of factors may be misleading. In the same vein, the interpretation of CPI profiles also rests on the whole picture. Gough stated:

> The scales are not intended to define traits or to specify psychometric factors; validation, therefore, should address itself to the degree to which the Inventory can forecast behavior and identify individuals who are perceived in characteristic ways. Factor Analyses, although of interest in delineating the internal structure of the Inventory, are not of particular relevance to the validational claims advanced for the test.[2]

In spite of these admonitions it seems plausible that the only way to establish or deny any correlation between personality and handwriting rests on factor analysis. Further studies seem to be indicated.

[2] Harrison, G. Gough, *California Psychologists Inventory Manual.* (Palo Alto: Consulting Psycologists Press, Inc., 1964), p. 8.

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Book Reviews

FAMILY NAMES AND THEIR STORY

By S. Baring-Gould. Seeley and Company, 1910. Republished by Gale Research Company, Detroit, 1969. Pp. 432. Price $8.00.

Baring-Gould was a well-known writer at the beginning of the century and, among other work, produced this fine book which the Gale Research Company are to be congratulated upon republishing. Baring-Gould gives the historical background of the subject, and subdivides the names in ethnological groups.

He is not always right in his interpretation for, as L'Estrange-Ewing realised, one must trace the names genealogically to be certain of origins, and this is not possible in a book of this kind. The errors, however, will only appear in certain surnames, such as in that of the reviewer which he gives as derived from the Scandinavian *Geirr,* meaning a spear. This was in fact the belief within my house in the fourteenth century, hence the black lion holding the spear in my badge and in the crest of Sir John Gayre, Lord Mayor of London, 1647. However, the actual name is Celtic and derived in the twelfth century from *Gaer* meaning fortress. It is only by taking the pedigree back to its origins that this becomes apparent. Consequently, Professor Watson's statement that Gair (another variant of the name) is equally at fault when he derives it from the Gaelic *Ghearr,* meaning short. This instance has been quoted merely to prove the point that no origin of a surname's origin is certain until it is traced by genealogy. This indicates how important is genealogy to ethnology and etymology, as it obviously is also to genetics.

The wealth of information to be found in this book is considerable and now that it is once more available its publication cannot be ignored in any library dealing with the origins of names, families, and the ethnology of the peoples of British origin.

R. GAYRE OF GAYRE.

AMERICAN STATESMEN: SLAVERY AND THE NEGRO

By Nathaniel Weyl and William Marina. Arlington House, New Rochelle, New York, 1971. Pp. 448. Price $11.95.

As is usual with any book with which Mr Weyl himself, or with a co-author, is associated we have a book of considerable length which goes deeply into its subject. Mr Weyl has one of the best brains of any man of our times. He is an intellectual in the best sense of the term, and not in that pretentious use of half-baked "intellectualism" that parades itself as intellect and yet has not enough practical common sense to run a whelk stall in London's Strand.

The publishers have shown supreme common sense in publishing this badly needed book by Weyl and Marina and are to be congratulated in having done so.

The work starts with Benjamin Franklin and the colonial age.

Opposition to slavery commences really with John Wesley's visit to Georgia in 1735. Nevertheless, William Penn, of Stoke Poges (which he acquired from my collateral ancestor Sir Robert Gayre) and later of Pennsylvania, along with other Quakers, was chiefly involved in the slave trade, and Negroes were not accepted by them for Quaker burial as late as 1756 (p. 14). The later militancy of Quakers against slavery must have been as a salve of their conscious guilt.

Incidentally, we might mention, that the Scottish Highlanders who settled in Oglethorpe's colony of Georgia, worked the land themselves

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without slave labour. The clan system they had inherited from the Scottish Highlands did not admit of the intrusion of alien people who were not children of the clan into their midst.

The authors are correct when they say that as the conception of original sin weakened in Christianity, so the religious opposition to slavery increased (p. 15), and fused with the ideas of the (non-Christian) so-called "Enlightenment."

It should be remembered that if we are to preserve any sense of history, the great jurist Grotius held that slavery of the Negro was consistent with the law of nations.

It is important to remember Benjamin Franklin's dictum (p. 16) that the immigration into any country was unnecessary as natural increase provided the cure for underpopulation. The purpose of this argument was to discourage free immigration from Europe and Roman Catholic Ireland, and forced immigration of Negro slaves. He thought it was a false opinion that with the aid of slaves America could vie with British imports in price. The same argument could be applied to Britain today when industrialists argue that West Indians, Pakistanis and Indians are necessary for her economy.

Negro slavery in the American South was a burden upon it as it discouraged white immigration.

This book deals in such detail with its subject that one could comment on almost every page of it. No study of American slavery is complete without a thorough perusal of this work. It has many shocks in store for those who have looked upon Washington, Jefferson and the rest, because of their love of liberty, as believers in racial equality.

MAN AND HIS KIND: AN INTRODUCTION TO SOCIAL ANTHROPOLOGY

By Thomas Crump. Darton Longman and Todd Ltd., London, 1973. Pp. 154, 7 illustrations. Price £1.70.

This is a different kind of introduction to social anthropology. It desires to show how small primitive societies make an understanding of contemporary man more intelligible. Human societies are considered under family, marriage and kinship, politics and economics, religion and culture, language and symbolism.

The author, who is British, and holds a position in cultural anthropology in the University of Amsterdam, deals with religion in a sympathetic manner, and ends with the outlook for cultural anthropology.

EVOLUTION AND HUMAN BEHAVIOUR

By Alexander Alland. Tavistock Publications, London, 1969. 37 figures, pp. 243. Price £1.80.

This is a very good outline of genetics which the author provides as a foundation to the study of human behaviour. The author recognises that cultural traits "develop against the background of biologically determined human nature" (p. 170).

The writer's statement that "while Darwin finally had the courage in *The Descent of Man* to place the human species where it belonged, in the animal kingdom anthropologists have been busy for one hundred years re-erecting a barrier between man and the rest of the animal kingdom" (p. 192) is very true and profound.

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THE EUROPEANS: AN ETHNO-HISTORICAL SURVEY

By John Geipe. Longmans, London, 1969. 40 plates, 28 illustrations, pp. 292. Price £3.

This book covers a wide field and is therefore of considerable interest. Unfortunately it has the blemish that it emphasises the usual propagandist interpretation of ethnology. For instance it claims that "The pre-Darwinian concept of immutable human stocks and strains is not merely untenable but a positive hindrance to the further understanding of the complex processes governing the evolution of our species. Population genetics, the recent offspring of Mendelism that aims to explain the hereditary and selective factors responsible for human geographical variability, has made nonsense of the outmoded and ambiguous notion of pure and mixed racial entities, and it is from the objective vantage point of this young and flexible science that the present survey views the inhabitants of Europe."

While this is true it is only half the truth. The fact is that the major racial stocks evolved in relation to their environment over a long period of time. The consequence is that there are more or less immutable racial stocks in the sense that the Caucasoid, the Negroid, and the Mongoloid remain permanent and fixed. Where infiltration takes place into these stocks of other strains, and where the geographical factors suit one stock more than the other, in process of time there is an elimination of one of the strains. In that sense the racial stocks have remained immutable and fixed. Even within a major stock such as the Caucasoid there is no doubt that the same thing in a modified degree takes place between the extreme strains such as the Nordic on one hand and Eastern Mediterranean, for example, on the other hand.

There are, of course, as this reviewer has pointed out from time to time, racial breeds which are hybrids between the major stocks of which the Ethiopic or Cushitic is an example. Where this occurs you expect a cline in the various ethnological traits between the one stock and the other, that is in this case between the Caucasoid and the Negroid and Australoid.

We have a similar cline between the Caucasoid in Europe and the Mongoloid in Asia, as seen in the question of blood groups and other traits as we pass from west to east. However, none of this rules out the validity of the permanence of race in itself. It merely indicates certain mixed areas where, given the right conditions, a belt, or belts, of hybrid stocks develop. However, the main stocks still remain settled and independent. It might be added that it is a short step if we make no qualifications from making the statement that population genetics are able to show that new races can evolve in the form of the hybrids to which we have referred, to the claim made on this dust jacket that race (which ultimately means heredity as it affects groups evolving in their specialised environments) is not immutable, and that in the hands of propagandists that race does not exist, or is so impermanent that it may be ignored. Nevertheless the first short step is in fact a half-truth without serious qualification, and the second and logical next step from such premises is no truth at all. We suspect that one reason for the tendency to emphasise this aspect of population genetics is to curry favour with this latter prevailing heresy of our times. It is a pity, therefore, that such popularisers of the subject should give an entirely one-sided point of view and a wrong impression.

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THE CHANGING NATURE OF GEOGRAPHY

By Roger Minshull. Hutchinson University Library, London, 1970. Pp. 160. Price £1.50 (cloth), 65p (paperback).

This book is designed to encourage an appreciation of changes which have occurred within recent years in geographical studies and reading, and is written by the lecturer in geography of Bishop Grosseteste College, Lincoln. Geographical determination is dealt with at some length and the author emphasises that geographers do not assert environment is not the most important determinant of human activity (p. 113).

WHO GOES HOME? IMMIGRATION AND REPATRIATION

By George K. Young. Published by the Monday Club, London, 1969. Pp. 38. 17½p.

This booklet is by a Scotsman who is a former Under-Secretary of the Foreign Office who has previous publications to his credit. It is an eminently cogent and sensible discussion of the whole of this problem, the immigration into Britain in recent years of large alien minorities from tropical equatorial countries.

He diagnoses the elements favouring this influx as the *liberal neurosis*. "We are here in the presence of some neurotic process inherent in the 'liberal-humanitarian' outlook which has dominated the British vocabulary for a century and a half. The liberal's comfortable self-projection of himself as 'Man' on to all mankind seemed to work as long as his cult objects were distant or harmless, such as the heathen to be converted, the poor to be lavished with soup and good advice, the oppressed to be 'liberated' at somebody else's expense" (pp. 10-11). Again, he writes: ". . . at the end of it all must come the recognition that the debased liberal universals are not the reality of mankind and that human differences up to now dismissed by the liberal neurosis as untidy loose ends, are the essence of the matter" (p. 13).

This is a powerful and scholarly exposition, and is so weighty that it is unlikely to be satisfactorily answered by those who do not believe that mankind is characterised by its diversity rather than its similarities.

JAPAN: AN ANTHROPOLOGICAL INTRODUCTION

By Harumi Befu. Chandler Publishing Co., Intertext Publishing Ltd., London, 1973. Pp. 210, 35 photographs, 2 maps. 11 tables and diagrams. Price £2.50.

This is a valuable work, and sets out the pros and cons of Japanese ethnology clearly. Concerning the Ainu, there is little doubt that it is a white Australoid (but not a Caucasoid as claimed by Howells) and it has relation to the Australoid and certain stocks in America. It may be related to the Jomon period (pp. 16 and 17), although this is held to be early Japanese. The Jomon period is of about B.C. 4000.

Linguistically there seems to be no doubt the Japanese language is related to the Korean or Altaic, and is certainly unrelated to the Chinese.

Rice cultivation came directly to Japan from Korea, and it is significant that the skeletons associated with it resemble the Koreans (p. 19).

Shintoism is shown to be of prehistoric origin in Japan (p. 95). It has some of the characteristics of Taoism, and is a religion of the mysterious forces inherent in nature, with the spirits and souls prominent. "Ancestor worship" is incipient within this religion (p. 104).

This is a useful book on Japan bringing it up to modern times.

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THE FUTURE OF MAN

By Robert Klark Graham, with an introduction by the late Sir Cyril Burt. Christopher Publishing Co., North Quincey, Massachusetts, 1970. Pp. 200, 10 figures. Price $7.95.

Professor Graham, who is listed in the *World Who's Who,* is an associate professor of some standing, who gained the support of Professor Burt, who has written a worthwhile introduction to the book. Professor Burt's death was a great loss to research in this field.

Professor Graham deals with the development of man, his command of nature, his arrestment of general intelligence improvement, and the regular rigorous natural selection which had preceded this event. The billions surviving today are of mediocre intelligence in all too many cases. He shows that half of those surviving today would, earlier, have been eliminated by natural selection. It is these who divide any nation into the "haves" and "have nots." These are those who form the basis of revolt against those of property and intelligence.

This situation Professor Graham calls a social derangement — as it is certainly against nature. He argues strongly, and rightly, for the increased reproduction rate of those of superior genes.

This is a first-class book, saying what needs to be said, in and out of season. Whether the world will listen is another matter — time will only show. Meanwhile we must all strive to such ends to turn a tide of development which must, otherwise, engulf civilisation in a tidal wave of disaster. Sir Cyril Burt quotes (p. 19) Dunn and Theodosius Dobzhansky as admitting 65-80 per cent of the differences in mental ability as being due to heredity.

Sir Cyril concludes that it follows that not only the resemblances between members of a family but also the differences may be the effect of their genetic endowment.

Both the author and Sir Cyril Burt agree upon pointing out a general decline in the intelligent and an increase of the least intelligent in many nations today, aggravated in some cases by the losses due to war and revolution. The decline in a people's moral fibre is only a symptom of the genetic degeneration.

This is a book which must be taken seriously as it crystalises what some of us have known and expounded, but which has fallen on deafened ears. Unless, however, these facts are acted upon the end is inevitable.

R. GAYRE OF GAYRE

GENETICS OF SEX DIFFERENTIATION

By Ursula Mittwoch. Academic Press Inc. (London) Ltd., 1973. Diagrams and photographs. Pp. 253. Price £7.75.

This book sets out to argue that sex differences are determined by the chromosomal regions and not by the genes. The author also discusses the nature of sex differentiation in the vertebrates. Normal and non-normal sex developments are dealt with and illustrated. Virus testicular feminisation describes the condition where the form is feminine but testicles are present although, usually, not descended. In this case there have been reports of a chromosome constitution of 46.XY. True hermaphroditism is shown to have similar chromosome irregularities. 46.XX were reported in 59 cases out of 108, while 21 cases had 46.XY. In the majority of hermaphrodite patients only XX cells have been detected. But in the course of development it is likely that in many cases there had been also an XY line which had been lost completely during development.

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Books Received

MEN OF INFLUENCE IN NURISTAN: A STUDY OF SOCIAL CONTROL AND DISPUTE SETTLEMENT IN WAIGAL VALLEY, AFGHANISTAN
By Schuyler Jones. Seminar Press, London and New York, 1974. Pp. 299, illustrations, maps and figures. Price £4.90 ($13.75).

This is a very informative work on the peoples of Nuristan, their resistance to de-Kafirisation, and, ultimately, their conquest by the Afghans, and Islamisation. It is recommended to all interested in the Kafirs of Afghanistan.

THE HIDDEN FRONTIER: ECOLOGY AND ETHNICITY IN AN ALPINE VALLEY
By John W. Cole and Eric R. Wolf. Academic Press Inc., New York and London, 1974. Pp. 348, 21 tables, 6 pedigrees, 12 figures, and also photographs. Price £5.90 ($12.50).

A German and a Romanian village have lived side by side for more than 700 years. Despite similarity of climate and terrain, their social structures are quite different.

THE WARP-WEIGHTED LOOM: STUDIES IN THE HISTORY AND TECHNOLOGY OF AN ANCIENT IMPLEMENT
By Marta Hoffman. Universitetsforlaget, Oslo, Bergen, Tromso, 1974. Pp. 427, 137 figures. Price N.Kr.60.00, $14.00 (paperback).

This is a very thorough study of the warp-weighted loom. The authoress first found people acquainted with it in Scandinavia, and then traces its history and prehistory, at the same time referring to the vertical and horizontal looms, from Egypt, Greece, and Rome. It is a model of what such research should be.

ASIAN AND PACIFIC ARCHAEOLOGY SERIES: No. 6 ARCHAEOLOGICAL EXCAVATIONS OF FORTIFIED SITES ON TAVEUNI, FIJI
By Everett Lloyd Frost. Social Science Research Institute, University of Hawaii, 1974. Pp. 175, 36 illustrations, 17 figures. Price $4.50 (paperback).

Excavations would appear to indicate that the forts were built about 1100 A.D. Further information from ceramical evidence would indicate settlement as early as B.C. 710.

ESKIMO BOYHOOD: AN AUTOBIOGRAPHY IN PSYCHOSOCIAL PERSPECTIVE
By Charles C. Hughes. University Press of Kentucky, 1974. Pp. 429. Price $12.75.

This is the life of an Eskimo, written by him when in his early twenties, in the 1930s and 1940s. This was a time when contact with the outer world was making itself felt. Professor Hughes must be commended for reproducing the autobiography.

ASIAN AND PACIFIC ARCHAEOLOGY SERIES: No. 5, LAPAKAHI, HAWAII
Archaeological Studies edited by H. David Tuggle and P. Bion Griffin. Social Science Research Institute, University of Hawaii, Honolulu, 1973. Pp. 329, 70 figures. Paperback $4.50.

This is a comprehensive survey of the work carried out in Lapakahi with the study of special problems.

DESTINY MARS
By M. W. Saunders, with Postscript by Duncan Lunan. Downs Books, Caterham, Surrey, 1975. Pp. 65. Price £6.

This book argues from the measurements of the Great Pyramid and Teotihuacen, draws parallels with Mars, and embarks on theories of interplanatory travel, although making it clear that there are no evidences by extra-terrestrial civilizations.

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Journals Received

ETHNOLOGY

Published quarterly by the University of Pittsburgh, Pennsylvania 15260, U.S.A. Vol. XIV, No. 3, 1975. Price $7 per annum.

REVISTA DE ESTUDIOS POLITICOS

Published by the Instituto de Estudios Politicos, Madrid 8, Spain, No. 200-201, 1975. Price $3.50.

POPULATION

Revue Bimestrielle de L'institut National d'Etudes Demographiques, Vol. 30, No. 4-5, 1975. Price F20.00.

JOURNAL OF BIOSOCIAL SCIENCE

Published for the Galton Foundation by Blackwell Scientific Publications, Oxford, England, Vol. 7, No. 4, 1975. Price £3 ($8).

NEUE ANTHROPOLOGIE

A quarterly journal published by Gesellschaft für Biologische Anthropologie Eugenik und Verhaltenforschung, Hamburg, West Germany, Vol. 3, No. 3, 1975.

HUMAN BEHAVIOUR

Published monthly by Manson Western Corporation, Los Angeles, California 90025. Price $14 per annum.

ALASKA

Published monthly by Alaska Northwest Publishing, Anchorage, Alaska 99509, Vol. XLI, No. 9, 1975. Price $1.

SOUTH AFRICA INTERNATIONAL

Published quarterly by the South Africa Foundation, P.O. Box 7006, Johannesburg, Vol. 6, No. 1, 1975. Price R1.00.

INTERNATIONAL SOCIAL SCIENCE JOURNAL

Published quarterly by U.N.E.S.C.O., Paris 75700, Vol. XXVII, No. 3, 1975. Price F16.00.

JOURNAL OF RACIAL AFFAIRS

Published by the South African Bureau of Racial Affairs, Vol. 26, No. 2, 1975.

THE PSYCHOLOGICAL RECORD

A quarterly journal published by Denison University, Granville, Ohio 43023. Vol. 24, No. 3, 1974. Vol. 25, Nos. 1, 2, 1975. Price $3.

Among the various interesting articles in Vol. 24, No. 3, is "The Ancient Background to Greek Psychology and Some Implications for Today," by Noel W. Smith. In the course of this he shows, speaking of the Ancient Egyptians, that they considered the life of man after death as the full man and not just a part (p. 313). Psyche, of the Greeks, was related to fainting or dying. (p. 317). This became the life-function of Aristotle's psychology. In Socrates are found the beginnings of a scientific model of psychology.

INTERNATIONAL MIGRATION REVIEW

Special Issue, Vol. 8, Summer 1974. Published by the Center for Migration Studies. Edited by Daniel Kubat, Anthony H. Richmond, and Jerzy Zubrzycki. Published quarterly. Price $12 per annum.

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